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Will Passenger Car Price Reductions Affect the Motor Truck Industry?

Present Indications in Truck Industry Show No General Tendency to Follow Passenger Car Reductions. Manufacturers Should Announce Either Price Guarantees or Reductions Promptly so as to Help Stabilize the Retail Market

MOTOR truck sales will undoubtedly be affected somewhat, temporarily at least, on account of the recent reductions in passenger car prices. Just how much of an effect passenger car price reductions will have on the motor truck industry remains to be seen. A few makers have already announced a cut in motor truck prices and perhaps by the time this issue is in the hands of our readers more price reductions will be announced. We do not, however, look for a wholesale slaughter of truck prices.

In the first place motor trucks cannot be classed in the same category as passenger cars. Passenger car and motor truck industries are two distinct and separate industries, although some dealers and manufacturers do not seem to think so.

Truck Increases Comparatively Low

First of all the motor truck manufacturer has not raised his prices in any proportion to the increases that have been made since the war by the passenger car makers. Between August, 1918 and August, 1920, the price of the Ford car had been increased 44 per cent or more than any other car. During that same period passenger car prices increased from 20 to 40 per cent, but few of the more substantial motor truck manufacturers have increased their prices more than 15 to 20 per cent during the past three years.

Prices in general, taking into consideration more particularly the necessities of life, have not come down to the pre-war level which the newspapers would have us believe. There have been reductions in some things, but very few commodities have gone back to the pre-war price level.

The truck manufacturers must realize that any action taken by Ford in reducing the price of his products must be considered as an exception and not as a typical case in the automotive industry. What Ford does cannot be taken as a criterion to be followed by other manufacturers in the automotive industry.

The whole situation resolves itself primarily into one of actual working capital with most companies. Where too much money has been tied up in stock the best thing for the manufacturer to do is to reduce his prices and do it right away, so as to turn over his stock and obtain working capital for future production. Some factories cannot afford to reduce prices and won't, for the simple reason that they have purchased supplies in advance, contracted for at big prices and to cut the prices of their product would mean a sacrifice and money loss that few manufacturers can afford. In making price reductions the factory must also consider the dealer and must be careful in not imposing a greater burden upon the dealer than he has at present. The factory must make some arrangement with the dealer, provided a loss has to be carried, when reducing prices.

Where the manufacturer feels it necessary to cut his prices, he should do so at once and have it over with. If he cannot afford to cut without a serious loss and he has money to tide himself over, his only recourse would be to stand pat and increase his selling efforts.

The fact that the price of labor has not dropped and that the cost of production has not taken any decided slump, are reasons why the manufacturer cannot afford to drop his prices without giving the matter very careful consideration.

Contemplated Increases Should be Announced

One thing, however, that the manufacturer should do immediately is to decide whether or not he is going to cut his prices. In either event he should announce the fact so that the dealer will know where he stands. The following announcements regarding prices have been received at this office:

The Diamond T Motor Car Co. states "That it is our opinion that the truck is entitled the price indicative of return to pre-war normal business conditions. We accordingly are reducing list prices from three hundred and fifty to eleven hundred dollars per chassis. Our present costs do not justify this reduction, but we are content to take temporary loss believing trend of market will justify our action and bring about immediate stabilizing of prices in our industry whose produce is more than ever needed at this time."

T. R. Lippard, president of the Stewart Motor Corp., believes that a reduction in truck prices will bring about pre-war condition in the industry. A telegram states "Ford's announcement will stimulate his sales and curtail his competitors. We announce reduction of Stewart Truck prices, primarily, to assist our dealers doing business now the public is convinced that lower prices are coming and will not buy until they receive them. Will sustain loss on present inventory but are willing to make the sacrifice to help put business on pre-war basis, thus insuring prosperity and full employment of labor."

Object is to Reinstate Normal Conditions

The Standard Motor Truck Co. has cut prices on four models. "This reduction was made to assist in the country-wide movement to reduce prices," said F. J. Fisher, secretary and treasurer of the company, "and will not have any effect on wages. We do not want to pose as philanthropists when we tell you that this action was taken in spite of the fact that all but two of our sources of supply informed us that they could foresee no reduction in their prices. But, we sincerely believe that this is the only way of ever bringing prices back to a normal basis, and we anticipate that our other sources of supply will soon join this movement."

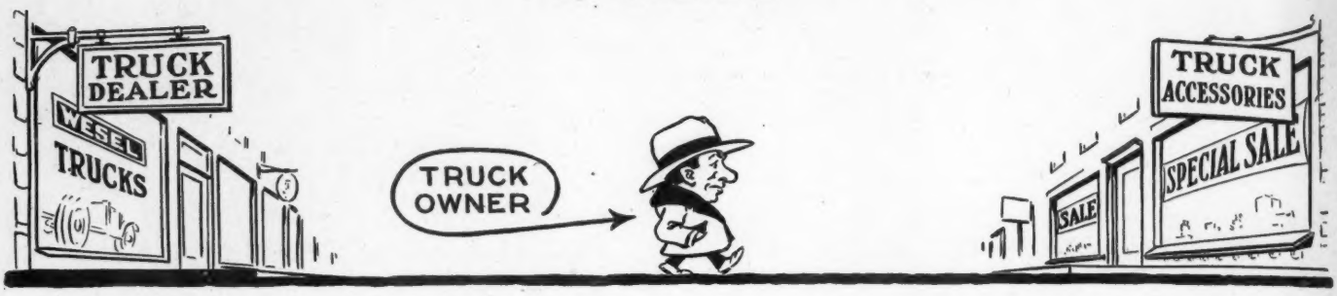
The United States Motor Truck Co., of Cincinnati, Ohio, have announced "that to reduce our price would be selling goods below cost and we have guaranteed the public and our dealers that our prices will remain without increase up to spring of next year."

L. B. Graham, sales manager of the Denby Motor Truck Co., has advised all dealers that present Denby prices will be maintained until January 1, at least.

The Traffic Motor Truck Corp. states that Traffic price "will not in any event be reduced prior to April 1, 1921, and in all probability not then."

Is He Buying His Equipment From You?

By C. P. SHATTUCK



CAL EMMETT, traveling representative for Yearrich tires, had just concluded his business with Billy Stebbins, in charge of Tommy Williams' tire department, and was regaling Stebbins with an account of how he put some pep in Henry Baker, head of the tire department for J. G. Wilkins, Tommy's former employer, when Tommy breezed in.

"'Lo, Cal. How's the tire business? Seen J. G. lately? How is he? When is he coming up this way?"

"Tommy's acquired the country habit of asking his questions in a bunch," thought Emmett. "Why, the tire business is coming along fine now, that the dealers have got over their scare," was the reply, and Cal outlined his recent visit to Henry Baker, and the results. "Saw J. G. the other day in New York and he asked about you. Says he is coming up to see you. He's quite busy working out details for his fall campaigns and is going to put some pep in selling winter equipment. Pep is what makes the wheels go 'round. Take the Yearrich tires for example. Now—"

But Tommy heard the tale too often, so he broke in by asking J. G. what he was doing. "Am quite interested in this winter equipment stuff. Billy here has been saying we ought to take on a line and push sales, but I have been so busy that I have not looked into it. It's our first winter up here."

Profits Will Pay Coal Bills

"Sure, we should," remarked Billy Stebbins. "There's a nice piece of money waiting to be picked up. I told Tommy that I could sell the stuff and that the profits would pay for the coal bills, and we have some cold weather up in this neck of the woods. Why, it was so cold last winter that we had to thaw out the gas before we filled up the trucks. Honest it was," added Billy, as he saw a smile break out on Emmett's face.

"What do you know about the truck dealers selling winter equipment for trucks, Cal?" asked Tommy. "As near as I can find out the average truck dealer sells trucks and bodies, but passes up the equipment stuff to the supply houses. Some of the dealers I have talked with say that there is nothing in it, that their salesmen won't push it for the profits are too small when compared with selling trucks. And others say that they can't compete with the supply houses and that their customers want extra discounts or the stuff thrown in when buying a new truck."

Sales Versus Order Taking

"That's what the city truck dealers say," replied Cal. "In the big places the streets are alive with supply houses that stick on that odd cent or cut price cards. Why, some of those birds will sell lower than the small truck dealer can buy. You're right that the salesmen won't push sales. but the truck dealers you have talked with are on the wrong track. Too many of them are willing to give a discount in the form of some equipment to close a hard sale. They are gyps, that's what they are. Now, it's different, or should be, in the country places like yours, Tommy, for the cut-price competition is not so keen. I think Billy is right. You should go after the business. I tell you, what let's do. Let's take a run down and see Jenkins, head of J. G.'s equipment department. And it will give you a chance to see J. G. The old boy will be tickled foolish to see you. Come on, let's go.

"All right," replied Tommy, "we will, and I'll take Billy along." Driving down in the Progressive sedan that was presented Tommy when he left J. G.'s employ to sell Pawtucket trucks, Tommy and Billy were busy commenting on the Pawtucket trucks they met. It was a cold day. The thermometer registered 36. About five miles out Billy signalled for a stop.

"What's the big idea, Billy?" remarked Cal. "Forgot something?" "Naw," replied Billy. "See that chap over in that field cranking his head off? I'm going over and give him a hand."

"Aw, forget it. That isn't a Pawtucket—it's a Whoisit. Any bird that buys one of those old boilers deserves the worst. Come on, Tommy, let's beat it. But Tommy shook his head and remarked, "Let's tag along with Billy. He's got something up his sleeve and I want to see the play," so Cal with many grumbles climbed out and wallowed through the field. "Hey," he exclaimed, "Who's going to pay for the new shine I'll need after I plow through this muck?" Cal was fastidious as to his appearance and always picked the dry places when walking.

"Oh, forget it, Cal," replied Tommy. "If Billy does not spring something I'll pay for your shine."

The man grinding the crank proved to be a farmer of the nickel-nursing habit who balked at the price of a Pawtucket truck. He had an old Whoisit unloaded on him because the price was attractive. Although cold, the perspiration stood out on his face and what he was saying about trucks appealed to Cal, as he caught a few new cuss words.

Billy First Aid to Farmer

Bill Stebbins greeted the man cheerily, but the victim of cheap goods scowled. He thought Billy and Tommy had come to gloat over him and spring the usual "I told you so," but Billy did nothing of the kind. Instead he remarked that the gasoline these days was bum and that probably the carburetor needed a little change, and would Mr. Brown object if he looked it over. Brown didn't and so Billy tinkered around, keeping up a flow of educational comment.

"Old stuff," thought Cal Emmett. Tommy's elected for the shine, all right." After several unsuccessful attempts Billy got the engine running and let it run to

warm up. To Brown he remarked, "You will have more trouble starting her when it gets colder. You see, the carburetor was built for better gas, which was sold in the days she was built."

"Anything I kin do to make her start easy, Mr. Stebbins?" asked the farmer. "By heck, I can never tinker with her like you do."

"Let me think," said Billy, and he appeared to indulge in serious thought. "Ah, I have it. You put a hot air stove on the carburetor and install a priming device and that will fix you up so you can start easy and you will save money on gas."

"A stove, is it? No, that will cost too much. And how can you put a stove in? There ain't room and besides it would set her afire."

Cal Emmett indulged in a great big grin, but Tommy or Billy did not, for they knew the farmer temperament and had long since learned that it does not make friends to display contempt for lack of knowledge by a possible prospect or customer. Educate them, explain in simple language, making an anology that the prospect will understand was their rule and it was a winning policy.

So Billy explained that the gasoline of today was very heavy, bum stuff, and that it did not vaporize. He also explained how the mixture was made, told the farmer that cold air prevented the gas vaporizing as it should and how the particles of raw gas affected starting and lubrication. Explained how the stove was constructed and what the heat did to the gas. Figured out roughly how much gas it would save and then proceeded to explain how a priming device would save all hard cranking. Gave the farmer an approximate price on the cost of the apparatus.

The Influence of Mail Order Books

"I've seen one of those jiggers in our Smears and Buckroe catalogue," remarked the farmer. "And it was cheaper than you said. Guess I will send a money order this afternoon." The mail order catalogue is, by the way, the farmer's bible when it comes to buying. He looks up the price of a contemplated article in the catalogue and expects to buy nearby for the same price. The farmer rarely considers prompt delivery or service. And the case of Brown was no exception.

"And this is where our friend Billy stubs his toe, remarked Cal to Tommy, but the latter shook his head and said, "Wait for Billy's comeback."

"That's a good primer you mention, Mr. Brown," remarked Billy, "but it will cost you more than the difference in the cost of the one I mentioned to install it," and Billy went on to explain how the connections would have to be made and why the one mentioned by the farmer was not easily installed or adaptable to the Whoisit engine. "I can get you the one you named if you want and get it today, but you would have better results and would cost you less in the end if you use the one I mentioned. Now, if you order the Bestever, I will guarantee that it will not take over an hour to attach it and, I'll tell what I'll do, Mr. Brown, I'll show you how to work it and if it does not do as I say it won't cost you a cent. Now, as to that hot air stove. I'll take the measurements of your exhaust pipe and carburetor and call you up and let you know what it will cost, labor and all. But it won't be over———" and Billy named an amount. And Billy bid the farmer good-day and started back for the car.

"Well," remarked Tommy, as he stepped on the starter pedal, "Who pays for the shine?"

Has His Original Dollar

"It's a stand off," replied the Yearrich tire man. "Billy did spring a new thought on the catalogue stuff, but he hasn't sold that bird and I'll bet he won't. Why, that bird's ancestors came over on the Mayflower and when they landed on the Plymouth Rock they had just one bone. And they have been squeezing that bone ever since. Sell him? Why, you couldn't give him the stuff. Don't I know them. I'll say so. Why, that type buys its tires from the gyps in the city who send out those 50 per cent discount sheets," and Cal started in to roast this class of tire dealers.

But Tommy interrupted by offering to wager that Billy would sell Brown. "Make it the dinners for three. No, make it four, so as to include J. G. And we will dine at the Ilkmore Hotel," said Cal, the last maliciously, for that hotel had a reputation for high prices. Tommy accepted the wager and the subject was dropped.

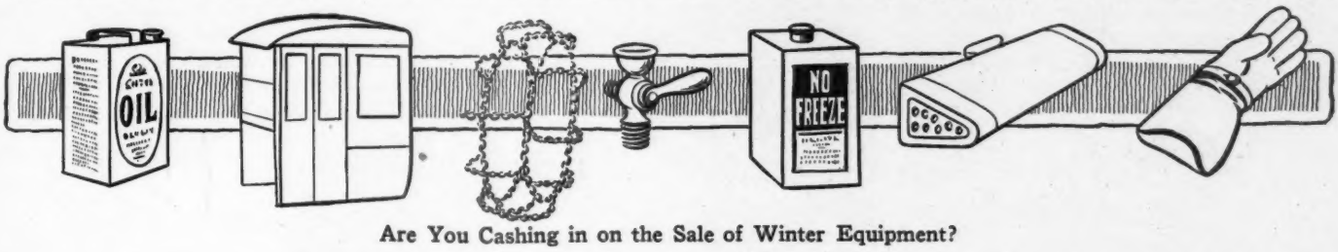
On arriving at the Progressive Motor Truck Company's salesroom J. G. met them at the door and pounced upon Tommy, greeting him like a long lost son. "Mighty glad to see you, Tommy. Come right in to my office. Del Hawkins is here, too," and J. G. dismissed his chauffeur with instructions to be within call.

Laying Out Merchandising Campaign

After the usual small talk Tommy broached the subject of his call, explaining that he was thinking of taking up the merchandising of truck equipment for cold weather and said he would like to get J. G.'s opinion. J. G. took up his extension phone and called Jenkins of the equipment department, remarking that they would have a conference on the subject. When Jenkins arrived and had greeted the visitors, J. G. opened the humidor and passed around the cigars. Cal Emmett, after getting his, took his departure to call on Henry Baker, of the tire department, excusing himself with the remark he wanted to see if Henry needed any more big pneumatics.

J. G. opened the conference by asking Jenkins to read his report on sales, turn over, investments and profits of the fiscal year for the equipment department, the truck end of which was kept separate from the passenger car. The profits, after overhead, etc., was deducted surprised Tommy, but Billy Stebbins wagged his head with a "I told you so" expression.

"That answers the most important question, Tommy," said J. G. "You will remember the year you left that we determined to push winter equipment and planned a campaign." Tommy did, for he had not at the time been sold on the idea. He thought, as do many other salesmen, that a truck dealer could not sell in the face of the cut-price supply house competition. Tommy recalled that J. G. emphasized the need of the salesmen educating their customers, old and new, to the need of affording their drivers protection from the cold weather and storms. He also remembered that J. G. pointed out that the truck dealer should recommend those devices that were best adapted to the Progressive truck; equipment that had proven practical in the acid test of service. Tommy also recalled what J. G. had said about the service angle. As near as he remembered, Tommy had to be sold on the idea that the duty of a truck dealer or his salesmen did not end with the sale of the chassis and body and service mechanically. J. G. had said that a dealer must see that his clients used the right equipment even if it was not handled by the company. And at Tommy's request, J. G. went over the campaign again for Billy Stebbins' benefit.



Are You Cashing in on the Sale of Winter Equipment?

Del Checkmates Sales Manager

Now, Del Hawkins, factory sales manager of the Progressive truck, did not and never had agreed with J. G. on the winter equipment business. Del argued that the time wasted by the salesmen trying to interest their customers would be more profitably spent in selling Progressive trucks, and he so remarked.

"Now, Del," said J. G., "You know you are wrong, and why not come clean and admit it. It's all right for you to hammer on sales. That's what you are paid for, but does the thought ever occur to you or your board of directors that the times are changing? When you finish a chassis and load a number on to us poor dealers, and get your money, you think you are through, but you are not. No, sir! You have only started. I am hazarding the guess that from now on you are going to see a lot more interest taken by you sales managers in us dealers for competition and stable business demands

it. And as for equipment, why, the time is coming when you will send us a truck completely equipped for the twelve months of the year."

"Not in my time or yours, J. G.,"shot back Del.

"Wrong again, Del. You and I can recall when the passenger car dealer had to sell the top, speedometer, windshield, gas generator, headlights, etc., and how one manufacturer started to supply some of the equipment as standard and how others followed. Today you get a car completely equipped."

"You can't compare the passenger car with the truck," retorted the Progressive sales executive. "Anyhow, the buyers of the passenger car pay for their equipment, don't they? It adds to the list price, what?"

Extra Profits for the Dealer

"Sure it does, but the equipment is supplied and the extra price, as you say, means extra profit for the dealer, doesn't it? And so, as we made money in the old days selling equipment for passenger cars, so we are making money selling equipment for the trucks. A truck dealer who is alive will not allow his business to go outside. At least, he shouldn't no more than we did when we were selling cars in the old days, but let's get down to business, for Tommy wants to know how to sell, Mr. Jenkins."

Selecting Winter Equipment

"In merchandising winter equipment for trucks there are four phases," remarked Mr. Jenkins. "The first is the selection and purchase of the right type. Second, the display. Third, advertising and circularization. Fourth, selling and service. In selecting winter equipment which may be designated as cabs, heaters, primers, radiator covers or hoods, tire chains or traction devices, anti-freezing solutions, lubricants for winter service, gloves, etc., I am guided in my selection by the performance or adaptability of the article to the Progressive trucks. In other words, a make or article that gives the best results is selected in preference to one that offers a better profit. A list is made out of these articles and their merits investigated. If it is a tire chain, for example, I endeavor to learn through the drivers of trucks using the device what results are obtained, faults, if any, and the research work is not confined alone to our truck but others of similar design. Trade publications are read for new articles and their merits investigated. If any of the devices are mechanical, such as a primer or a heater, I consult with the foreman of the service station, obtaining his ideas as to the practicability of the primer, etc., cost of installation. The cost or time required is important for it enables us to advise a customer of the time required to install it. Servicing the article is also considered."

"What make of tire chain do you consider the best?" asked Billy Stebbins.

"We are handling two lines. One the Sure Grip for solid-tired trucks and the regular chain for the pneumatics, but I am not advising the Sure Grip for the Pawtucket, Mr. Stebbins, at least, not without first investigating its use with your truck."

"Some buck-passer," thought Del Hawkins.

Window Displays Important

"The display," continued Mr. Jenkins, "is most important. We utilize three places. There is the salesroom, equipment department, where we stock the goods. Next we display chains, for example, in the salesroom of the truck department, on wheels, both solids and pneumatic. In connection we have weekly window displays; that is, we aim to change the display each week. We take the articles in their logical sequence. Take cabs, for example. These are not easily displayed in the small window, but we run a truck with a fully enclosed cab up near the window and show the cab with a door open. Use cards or signs with a punch in them calling attention to the need of a winter enclosure. Our next display window will be one on radiator covers. I plan to take a new Progressive radiator and hood and cover them with the hood we are pushing. In the window I shall place an old radiator, one that

Gratis or Cash?

has been frozen and with tubes bursted. There will be signs with ribbons, you know, the usual stunt, calling attention to the economy of using covers in cold weather, etc. Old stuff, but good if properly set forth. Another week we will make a drive on anti-freezing solutions.

Advertising and Circularizing

"Advertising and circularizing is most important. Use of local newspapers and copy with a real punch is prepared by our department. We get the technical or mechanical details, also practical view, from the service department. Take, for example, the tire chains. Copy with illustrations is prepared showing why trucks cannot get traction with both wheels in slippery places and in snow, how icy streets mean skidding and big repair bills and loss of the services of the truck. Circular letters are sent to the owners and a special letter to the drivers."

"Why the drivers?" asked Del Hawkins.

Selling the Drivers

"Because," was the reply, "You must create a demand for the equipment among the drivers so that if consulted by the owners the drivers will boost for your article. The same line of thought is employed with all of the equipment. With cabs and heaters we point out in our letters to the owner that greater efficiency will be secured from their operators if they are kept warm and good natured. And lots more along that line.

"Now, as to prospects. Of course, we have a list of our customers and this is checked over very carefully. Truck salesmen are expected to co-operate in exploiting our line as well as in educational work. A new customer is brought to the equipment department, where I personally take charge of him, the idea being to avoid as much as possible the customer endeavoring to secure some small stuff free with the truck or a discount on larger articles."

"That's the point," exclaimed Del Hawkins. "It's the weak link in the chain. I can imagine a salesman telling a prospect that he cannot have a $5 primer attached free, especially if it would close the sale of a chassis. Do you suppose the salesman would say no. Not on your life."

"Some salesmen, or rather order takers, wouldn't," broke in J. G., "but mine will," and as Del shook his head, J. G. said, "Now, look here, Del. If a Progressive dealer writes in that he wants five 2-ton trucks, but makes the order conditional that you supply free of charge an extra tube, what do you do? Give him the tube rather than lose the order or say no?"

"Say no, and right loud," snapped Del. "Not even J. G. could put that over on us and we think a right smart heap of him at that."

Why No Gifts of Equipment

"That's the answer," said J. G. "The buyer of a truck has no more right to expect extras than I would of you. And because a few gyps do it is no reason why real truck dealers to. Why, it is just as reasonable to make an owner a present of a repair bill. Continue, Mr. Jenkins."

"The matter of selling," said that individual, "is as Mr. Wilkins puts it. The equipment department is separate from the truck sales and goods are merchandised as such."

"How about the cut-price supply house competition?" asked Tommy, who had been a listener up to this point.

Value of Flat Rate

"We do not take them into our consideration at all. It is true that some customers may say that they can buy the same primer for a few cents less, but our comeback is that the customer will have to take it to a garage or repair shop and have it installed. Now, here is where our flat rate comes in. With certain devices like the primer or heater, we have kept close figures on the time and material required to install the device. From these we have arrived at a price for the work, also the time required. Take the heater, for example. Our shop can install one in 45 minutes. The labor cost is so much and material charges so much more, total is——" and the speaker named so low a figure that Billy Stebbins took notice. "Now, an outside shop, not familiar with the work, would make the usual labor and material charge. And they can't compete with our work, for we have it down pat for the trucks."

That's all right for your trucks, but how about other makes?" asked Billy Stebbins.

"On makes other than the Progressive we make the usual time and material charge," was the reply. "And we have quite a business equipping our line and we have a few out and more going every week. I might suggest the possibility of the influence of the flat rate work on our line on the customer with some other make, the Pawtucket, for example," and Jenkins grinned at Tommy.

The Selling and Service Angles

"Selling and Service are allied. The salesmen are requested to turn in leads, as are the men in the service station. If a truck comes in without winter equipment the foreman asks what he has and if he is shy any needed article he makes out a memo and sends it to us. Incidently he talks equipment to the driver and if the truck has no good winter cab, a heater or a radiator cover, he sympathizes with the driver. Sort of starts something. Then we follow up. We have a salesman in our department who calls on the owner. I guess that's all, gentlemen. Any questions?"

"Yes," spoke up Billy Stebbins, "How would your tactics apply in our district? You know, we deal with the farmers and they are some cagey birds. They are some buyers, take it from me."

"Why," said the equipment executive, "I don't think you need any suggestions from me, Mr. Stebbins, if what I hear about you is true. They tell me you have the farmers eating out of your hand," and Billy actually blushed at the compliment. "After all," continued Jenkins, "you have really got to sell the goods on the basis of service and after selling see that the goods live up to your claims. Speaking of the service end, it is a good plan when you sell a heater or priming device to follow up and see that the customer is satisfied. It may be that a trifling adjustment is needed or the customer may not be using it just right. You know the old saying, 'If you are satisfied tell your friends, but tell me if you're not.'"

Cal Emmett Hears Bad News

At this point Tommy started to tell how Billy talked hot air stoves and a priming device to Farmer Brown. He had reached the point where Billy talked cut prices when J. G.'s desk phone rang. "Some one from the Pawtucket Motor Truck Company wishes to speak to you, Mr. Stebbins." Billy took over the receiver, listened and then said, "Wait a minute." He laid the receiver on the desk and disappeared in a hurry, returning with Cal Emmett in tow. Motioning to the Yearrich salesman to pick up the receiver, Billy shouted into the transmitter, "Sorry, Jim, to break away without listening to you. Now, go ahead and shoot." Cal Emmett listened and this is what he heard: "Hey, Bill, you know that old nickel-nurser, Brown, who bought that old Whoisit truck Well, he just called up and asked for you. When I told him you were away he said, 'Tell Mr. Stebbins to get me that hot air thing and starter.' What's the joke, Bill?"

But Cal Emmett made no response. He was figuring out how he could charge up dinners for four at the Ilkmore in his expense account and get away with it. And there was that matter of a shine, too.

Survey Reveals Better Business Outlook

THE Fidelity and Deposit Company, of Maryland, made a survey of the industrial, agricultural, financial and political conditions of the United States, and which, according to Franklin K. Lane, former Secretary of the Interior, is "the first comprehensive, carefully made and approximately accurate picture of these conditions throughout the country."

The survey is made up of telegraphic answers from 900 field representatives of the Fidelity Company, answering 32 fundamental questions. Space does not permit giving in detail Mr. Lane's report. Under the head of industrial conditions, Mr. Lane says: "Economically, the United States is shown to be better off than any other country in the world. There is no evidence of idleness. Our people have the opportunity to work and are at work. There is no shortage of raw material sufficient to curtail production reported from any of the nine geographical districts into which the country was divided for the purpose of the survey. Only in the district including Minnesota, the Dakotas, Iowa, Kansas, Nebraska and Wisconsin is there evidence of a lack of orders. New England industries report a number of cancellations, but there, as elsewhere, manufacturers are well filled with calls for their products. Transportation conditions are improving everywhere and a substantial reduction in the freight car shortage is reported in every district except in the Rocky Mountain States, in the Southwest and in the district including Kentucky, Tennessee, Alabama and Mississippi, although an improvement is noted in the latter district.

"A shortage of coal and the failure of labor to increase individual productivity appear to be the only two unfavorable aspects in the immediate industrial situation. The Rocky Mountain and Pacific States report a sufficient supply of fuel. All other sections of the country are feeling the shortage, but it is apparently least felt by the South Atlantic States.

"Agriculture is generally recognized as the backbone of the country, and the farming situation is excellent; from no section has an unfavorable report been received. Our farmers appear everywhere to be in too happy a mood to permit at this time the cynicism, 'the farmer is always grumbling.' They are well supplied with funds from the sale of this year's crops, but they are wise in that they know that more favorable marketing conditions can be created. The recent drop in grain prices is reported to have had no effect except in the Rocky Mountain States. Farmers of Illinois, Indiana, Michigan, Wisconsin and other Central States withhold grain.

"In the financial field, money is tight. That may mean several things: First, that the people want money badly to put into producting activities; second, that the banks attempt to get whatever the traffic will bear, shearing close to the skin; third, that there is an adequate supply of money; or fourth, that those who have money lack confidence. There are other reasons, no doubt, and among them the one that, as the dollar now buys less than heretofore, people with money wish to charge more for the service that money gives. No one can accurately say which of these causes is the most important factor, but probably all contribute to the present situation. The banks are well lent up, although money is available in the East and Central districts at from 6 to 8 per cent interest. The Southwest, Rocky Mountain and Pacific States report the highest interest rates, averaging from 8 to 10 per cent, and in the Mountain district as high as 12 per cent.

Truck Show Feature of Trenton Fair

Power farming appliances predominated in the exhibits at the Inter-State Fair at Trenton, N. J., September 27 to October 1. Passenger cars, trucks, tractors, electric lighting plants and stationary engines were shown in numbers.

The exhibits of trucks equaled in number and variety many of the indoor truck shows. Besides the many chassis shown, a large number of trucks with bodies designed for farm use were exhibited. Farmer interest in truck body design has grown to such an extent that a better body often swings the sale.

Pneumatic tires for trucks were very much in evidence and are undoubtedly winning their way with farmers because a pneumatic-tired truck can do the work required of it on the farm.

Among the trucks exhibited were: Traylor, Day-Elder, Dearborn, Norwalk, Autocar, G. M. C., Stewart, Selden, International, Brockway, Hurlburt, Commerce, Pierce-Arrow, Kissel, Winther, Apex, Acme, Kelly-Springfield, Garford, Rowe and Samson.

A realistic mimic battle was staged by soldiers of the First Division from Camp Dix, N. J., the last day of the fair. An attack by infantry, aided by artillery barrage, smoke screen and tanks, was made against troops in trenches, protected by machine guns and artillery. As a spectacle, and a thrilling one, the show made an impression on the crowds of people there. The demonstration of the need and use of machinery in warfare was an object lesson; it showed the farmer his need for somewhat similar power and machinery on the farm in times of peace.

Repairing the Giant Pneumatic Cord Truck Tire*

Being the First of a Series of Articles on This Important Subject and Which Deals With the Equipment Required and the Handling of Surface Tread Cuts

FIRST of all let it be known that this article is intended for the use of tire repairmen who have had some experience in repairing the smaller sizes of cord and fabric tires. Minor details, therefore, that are common knowledge to all tire repairmen are omitted.

In making repairs on large size pneumatic truck tires it is imperative that only the best of materials be used, and that the greatest amount of care should be exercised, otherwise the repair will surely be a failure. Although the general procedure is somewhat similar to that employed in repairing smaller sizes of tires, attention is called to the fact

Filling Cavity

This shows the method of handling the stitcher when rolling the tread repair gum G-100 into the cut

that only with the proper size equipment, and good materials can satisfactory work be accomplished. It is also essential that repairs to the large tires be made as soon as possible, as a repair promptly made is more liable to give satisfactory service because the separation resulting from the injury will not have extended to the point where the fabric carcass has been dangerously weakened, in other words, a tread cut should be repaired promptly and retreading jobs should be undertaken before the tire has worn down into the fabric.

Repair Equipment Necessary.

A complete set of sectional moulds and sectional air bags are required, one for each size of tire to be repaired. These moulds are one quarter circle and can now be obtained in sizes as large as 44x-10, which is the largest tire now in general use. In view of the fact that most of the pneumatic truck tires are oversize care should be taken when purchasing this equipment that the moulds are large enough in cross sections.. Equipment which is too small should not be used, because the tires will be distorted in the curing operation.

In view of the greater thickness of the truck tire wall, it is necessary that a lower pressure be used when curing a large size tire. It is also preferable to use the stepped-up cure, that is, starting the cure at a comparatively low pressure and then stepping it up at intervals. This method insures a more uniform cure. A special regulating equipment is not absolutely essential as a cure can be obtained with a continuous steam pressure of 40 lbs.

It is important, however, that the higher steam pressure be maintained in the mould, regardless of the boiler pressure. Therefore, each sectional mould should be equipped with a pressure regulating valve and a steam trap so that any steam pressure desired can be maintained in any mould regardless of the boiler pressure.

Sectional air bags of the proper size, both in cross section and length, should always be used. Combination air and steam bags, with a valve stem on each end should be obtained, so that internal pressure may be obtained by the use of air or steam. The use of steam in the bag greatly facilitates certain kinds of repairs, especially fabric breaks or cuts where it is necessary to vulcanize a patch to the inside of the tire. There is a stem on each end of the bag to allow for circulation when steam is used. Since 60 lbs. steam pressure must be used in these bags, it is not possible to use them in this way unless the individual moulds are equipped with pressure regulators so that the two different pressures can be maintained at the same time. Time is saved by using steam in the bags where it is necessary to vulcanize an outside repair and an inside repair in the same section of the tire, since it can all be done at the same time. If the steam bag cannot be used, the outside repair must be made in a sectional mould on air, and then the inside repair must be cured on an inside patch vulcanizer.

Tread Cut

A slight tread cut will be seen alongside the file. This is a case where there is but slight separation. The method of repair is described in the accompanying article.

If it is not possible to use steam in a sectional bag, a set of inside patch vulcanizers must be obtained, inasmuch as inside repairs must be cured from the inside. **The tires are too thick to be cured through from the outside.** These patch vulcanizers should be used with a steam pressure of 40 lbs.

Large size vulcanizing kettles are the best for retreading of truck pneumatics. These kettles can be had in sizes up to

Tread Cut Ready for Filling

This shows the cut after the loose rubber has been cut out and the surface cleaned and buffed ready for applying the cement. The lighter area around the cavity shows the extent of surface buffed.

44 x 10 in. The 44 x 10 kettle must have a clear inside diameter of 50 ins. The kettle should be equipped with a pressure regulator and a steam trap for obtaining a stepped-up cure, although a cure can be effected with a continuous pressure of 40 lbs.

Retreading rims are also necessary if retreads are cured in a kettle, two sets of rims being required. The 36 x 6 retreading rim takes tires 36 x 6 and 38 x 7; the 40 x 8 rim takes tires 40 x 8 and 42 x 9. Although a retread can be cured in a sectional mould, it takes six times as long and the work is not as satisfactory as with the kettle method.

When curing a retread in a vulcanizing kettle or pot heater, endless or full circle air bags must be used to obtain sufficient internal pressure. A bag for each size of tire is required.

Truck Tires Cannot be Turned Inside Out

Owing to the large size, the tires cannot be turned. Repairs of any kind to the inside of the tire, therefore, make it necessary to separate the beads far enough apart to make accessible the inside surface. Large tire separators or

*(The method outlined in this and succeeding articles are those recommended by the Experimental Department of the Goodyear Tire & Rubber Co., of Akron, O. This company is continuing its experiments in this work and will welcome any criticisms or suggestions for improvements.)

blocks with notched ends can be used. Separating also makes it easier to apply a retread band, as it decreases the outside circumference and less stretching of the retread band is required.

Chain Block Assists in Separating

By placing a series of hooks in the floor and gripping one bead of the tire and attaching another set of hooks to an overhead chain block the largest tires can be easily separated. This method also assists in applying tread bands or inserting full circle air bags. The chain block, if on an overhead trolley, is useful for lifting large tires in and out of moulds or kettles.

Before applying inside patches, the **surface covering or liner must be removed** and the exposed surface buffed or roughened for the cement to properly adhere. For this work a handled scraper with edge curved to fit the inside contour of the tire and with saw-like teeth in its edge, can be used. The tooth points should be slightly rounded and sharp. Of course, portable buffing outfits can be used. The other small tools and equipment are the same as used in all tire repair shops. The Goodyear Co., supplies air bags, otherwise the above special equipment must be obtained from manufacturers of tire repair articles.

The usual line of tread and side-wall gum, repair gum, quick cure gum, cord repair fabric, large size cord patches, bead cover fabric, breaker fabric and regular cure vulcanizing and other kinds of repair cements can be had from the Goodyear company.

A steam boiler with a large enough capacity to supply plenty of steam at 60 lbs. pressure should be installed. A small boiler is often the cause of bad repair work, in that it will not supply sufficient steam to properly heat the moulds.

Method of Handling Surface Tread Cuts With But Slight Separation.

The average surface or tread cut, if not deep looks very insignificant. Such a cut is shown in the accompanying illustration, alongside of the file which is lying on the tread. This cut is so small that it can hardly be noticed, but, if neglected, moisture and dirt will work through into the carcass, Grit and moisture cut and rot the cords. The damage will spread until the cause is removed, as the sand keeps filling in, being forced between the layers.

The first step in such a repair is to pry into the cut with an awl and determine the extent of the damage, removing any glass, sharp stones, metal or dirt that may be found in the cut. In case the tread has not been loosened around the cut nor the cords damaged, cut away the rubber for about one-half inch on each side of the cut down to the bottom of the cut. This cavity should be tapered or under cut, so that the base is larger than the top. This keys or locks the new repair rubber in place and presents the smallest possible repaired part to come in contact with the road.

However, if it is found that the tread has been loosened, all loose rubber must be cut back to the point of separation or a little beyond. If this results in an area less than 4 sq. in. the edges should be tapered. But, if the area is larger than 4 sq. in., bevel the edges of the cavity in the opposite direction so that the hole is larger at the top than at the bottom. If there is serious damage to the cords or the separation is more extensive other methods will have to be employed, as described in a later article.

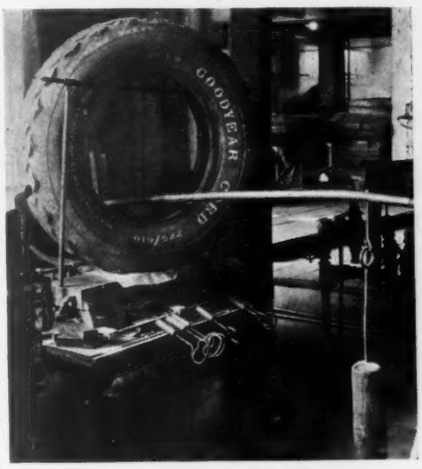
Cleaning and Beveling the Surface.

The exposed surface should now be thoroughly cleaned and buffed. Where the cavity is small and under-cut, the buffing is done by hand with a rat-tail rasp. A power-driven wire brush can be used on the larger holes which are not under-cut. Brush all dust out thoroughly and remove all buffing dust with gasoline. In the accompanying illustration is shown the tire after this has been done and the surface around the opening thoroughly buffed.

Building Up the Surface.

Three coats of cement should now be applied, C-15 or C-16 being recommended, the first coat thin and well brushed in, the second and third medium heavy.

For the first coat the cement gives good results when diluted with two parts high test gasoline and one part of C-15 cement or C-16 cement should be used for the first coat. This first coat should be allowed to dry 45 minutes before applying the second.



Hot Plate Cure

Note the long arm and weight used to get sufficient pressure on the block, which forces the surface to be cured against the Holland on the hot plate.

For the second coat, C-16 cement can be used straight or C-15 diluted with equal amount of gasoline. This should be put on about like ordinary paint and allowed to dry 60 minutes and on a damp day longer, until all gasoline has evaporated.

The third coat, using the same cement, should be applied about the thickness of paint as with the second coat and allowed to dry from three to five hours, the time depending upon the humidity of the air. Cement is not considered dry until all the solvent has evaporated. When using cement, mix it thoroughly, otherwise solid matter may settle to the bottom, giving poor results.

Do not try to hasten the drying process by placing the tire in a draft, blowing upon it or placing it over a vulcanizer or other heat. Any such attempt to hasten the drying results in a hard surface film with soft cement beneath. If this has been done blistering will result. On the other hand, if the cement is allowed to dry too long all adhesive qualities are lost. Whenever possible hang the cemented surface downward so that it will not flow into depressions, forming little pools.

If the cut does not extend below the breaker strip or exposed edge of the tread gum should be covered with narrow strips of 1-32 inches thick, G-170 cushion gum. This will tie the new gum to the old. Fill the cavity with tread repair gum, G-100 if white, or G-105 if black. If the repair gums are made tacky by washing with gasoline, they must be allowed to dry thoroughly before applying them. In applying thin layers of cushion gum, extreme care should be exercised to prevent trapping air between the layers as separation and blistering will result in the vulcanizing. A diligent use of the stitcher will prevent this difficulty.

When the cut extends down to the cords, fill the cavity up to the bottom of the tread with cushion gum G-170 and then with thin strips of G-170 cushion and the tread repair gum from there up. If over 4 sq. in. in area a piece of breaker fabric, cut to fit the cavity, should be placed on top of the cushion gum before applying the tread gum.

Again, great care should be exercised to get the repair stock well packed into the cavity and each layer well rolled in to prevent air trapping before applying the next layer.

Now, trim off the rough edges of the filled-in repair stock level with the surface of the tread.

Preserve the Non-Skid Surface.

With a large repair, where there are still non-skid projections on the tread, this surface can be preserved and carved out from the repaired section in the usual manner. If the repair is cured on a flat plate, the non-skid effect can be cut into it with a sharp moist knife after the cure. If the repair is large enough to be cured in a sectional mold, cut the non-skid design into the uncured rubber, fill same with a thick soapstone mortar, wrap and cure in the mold.

Use a hot plate if the repair is small enough so that the entire surface can be brought into contact with the plate at the same time. If this cannot be done a sectional mold must be used. The objection to the sectional mould is the over-curing which it gives to the tire adjacent to the actual repaired surface, but where extensive separation has occurred the sectional mould must be used.

When curing on a hot plate, place a piece of holland between the tire and plate to give a smooth surface to the re-

pair. Be sure that the entire surface is in contact with the holland cloth on the plate. Place a flat block, preferably of hard rubber, a little larger than the repair, directly over the repair and inside the tire. Weight this down by means of a pressure bar with suitable weights or springs at the outer end. Note the length of the bar used in the illustration.

Length of Cure

The thickness of the new rubber in the repair determines the length of cure on a hot plate, as shown by the table:

Thickness of Repair	Length of Cure	Steam Pressure
¼ in.	1 hr.	40 lb.
½ in.	1 hr. 35 min.	40 lb.
¾ in.	2 hr. 10 min.	40 lb.

Length of Cure in Mould

When curing in the sectional mould, first place a sectional air bag on the tire; second, cover the portion of the tread which will come within the mould with soapstone mortar, carefully filling all crevices and depressions to preserve the tread design; third, cover this surface with a strip of wet muslin somewhat wider than the tread and cut on the bias; fourth, place the tire in the hot sectional mould; fifth, apply the beadings; sixth, inflate air bag to 100 lb. pressure and cure, as shown in the table.

Thickness of Repair	Length of Cure	Steam Pressure
¼ in.	1 hr.	40 lb.
½ in.	1 hr. 35 min.	40 lb.
¾ in.	2 hr. 10 min.	40 lb.

In finishing the tire after it has been removed from the mould, trim or buff off all ragged edges.

(To be continued)

Is Snow Removal a Dealer's Problem

By C. S. PERRIE

IF one were to make an analysis of the laws of the various States in the snow belt of this country, he would be much surprised to learn that most States have made no provision to keep the State roads open during the winter months. And one would learn that practically 90 per cent of the State laws place the burden on the county or town. In other words, action must be taken by the town or county which must appropriate money for the work. And this is where the shoe pinches. To use a slang expression, "There ain't no such animile."

Why the Buck-Passing?

Take for example, a certain State in New England, where there's a road that is a chain in the link of a well traveled highway—a main artery over which is transported thousands of tons of raw and finished material by motor truck. This highway is a State road up to the boundary of a certain town. The town road may be a mile or several, but it is a town highway and as such is so controlled. Now, the law of this State is very definite if fixing the responsibility for the meeting of snow conditions, a certain section and chapter stating that the towns are responsible, but **the town fathers ignore the law.** In the State the writer has in mind the town officials assume the attitude that it is up to the State to provide the money and the equipment, and to do the work. And I doubt very much that some of these towns, on the main line, would do the work or any part of it even if the money and equipment were supplied. It is so easy for the town fathers, if they were asked why they did not spend the money or use the equipment, assuming both were furnished, to say "We were unable to obtain men to operate the equipment."

The Matter of "Discretion"

If you will read some State laws, you will note that it says indirectly, and subtly, that the expenditures to be made by a town for snow removal or keeping the highways open, is at the discretion of the town authorities. Roget's Thesaurus of English words explains that discretion is an act of volition or choice and the town fathers are 100 per cent active in taking advantage of the joker in the law. In those States making provision for keeping the State high ways open, and where the intention of the law has been carried out, the towns have failed to keep their roads open. By roads, is meant from the State line to those kept open in the village or town. Reference is not made to the larger places where there are trolley lines or where business compels the removal of the snow, but those smaller places through which the truck engaged in inter-city service or long hauls must pass.

What the Figures Show

An analysis of the snow removal laws of 15 States, selected at random and without analyzing traffic conditions or roads, shows that 74 per cent have no law, or passed any snow removal bills, or are not contemplating any. About 54 per cent of the States having laws pass the buck to the towns or counties. Approximately 13 per cent of the States **ignore snow removal plans and maintain a careless attitude towards motor highway transportation.**

The average State highway engineer is not to blame for the existing conditions. He realizes the necessity of keeping open at least those roads subjected to heavy motor traffic. He points out that the driving in one rut, which is practiced where the snow is not removed, develops ruts which freeze and, therefore, cause damage to the road surface, especially when thawing out occurs and the ruts become filled with water. But the engineer is helpless to a great extent. He may recommend snow removal, the appropriation of money for the work and equipment, but he meets with weak support from all. And particularly from the town fathers who resent any legislation that will interfere with their control of their highways, begosh! Perhaps these town fathers think that the giving over to State control of their roads in winter may lead to State supervision in the summer. Perhaps those towns which reap a rich harvest by enacting their own speed limits and ordinances fear to lose a tidy sum. And during the last month or two many towns in the East have reaped a rich harvest from trucks and passenger cars.

Attitude of Legislators

An example of the effort of the engineers and attitude of the legislators is the following. The engineer of a certain Eastern State in his report to the legislature said among other pertinent things:

"In view of the great importance of highway transportation in solving problems of direct importance to the post-war period, too much importance cannot be placed upon the **keeping of the highways open during the entire year.** It may be sufficient upon certain roads remotely located, to open the roads after heavy snows only sufficiently to allow light vehicles to get through, but on **our main highways** or trunk lines **it is very necessary to meet the snow problem** in such manner that the normal travel to which the road is subjected will not be interfered with seriously. **The problem is now so serious that it must be met squarely.** We can no longer maintain a careless attitude towards the subject of meeting snow conditions; we must no longer look upon snow as a necessary impediment to traffic; and we must not sit by complacently and allow traffic to fight its way through drifts or of necessity cease until nature takes care of the situation."

Despite the concrete facts supplied by this engineer, did the legislature enthuse? It did not. Probably, I say probably, the engineer was told that the legislator had an ordinance prohibiting the use of cut-outs, and would Mr. Engineer please close his? Politics, plain, every-day politics, which brings us to the opening of the story; that is, if it is logical to have more than one.

What the Dealer is Responsible for

I am going to ask you, Mr. Dealer and reader, to read a second time that remark of the engineer, "We can no longer maintain a careless attitude towards the subject of meeting snow conditions * * * must not sit complacently and allow traffic to fight its way through drifts, etc." At the risk of bringing down a storm of disapproval upon my head, I am going on record as saying that the highway conditions insofar as snow removal is concerned is not up to the engineer nor to the legislators. **The motor truck dealers are wholly to blame because they sit by "complacently."** Yes, Mr. Dealer, you and your employees and the entire motor truck industry are responsible.

While arraigning you I might as well arrange a large bill of particulars and incorporate them in the indictment. Have you ever, directly or indirectly, made any effort to have a bill passed in your town, city or village that would make snow re-

moval a real fact, not a scrap of paper? Have you ever used your influence with your local senator or congressman or legislator, to have a bill introduced that would give the State control over the highways and over the towns through which the trunk lines pass? Have you ever appeared at a hearing on any such bill? Have you ever tried to wake up you customers to the need of exerting pressure, political pressure, on the law makers? Has your organization, if there is one, ever made a concerted effort for snow removal laws. The answer is **NO.**

Letting George Do It

There is altogether too much of this "Letting George Do It." Some organizations employ executive secretaries and having done so, the secretary becomes "George." Did it ever occur to you, Mr. Dealer, that the saying "the organized minority control the majority?" A few legislators enact laws for hundreds of thousands. And a few policeman keep thousands in order. Ever notice a gang of boys shooting craps in an alley? When one raises the cry of "Cheese it, der cops," what happens? Why, they scatter. Not that they are afraid of the officer, whom they may know, but the representative of the law, the execution of it. This gang of boys might be able to take away the officer's club or gun and tie him up, but they don't because he represents power. They know that other officers will prosecute them.

The Dealer a Power if—

It is up to you, Mr. Dealer, to become the organized minority and be the policeman. You have a power, an influence, that properly exerted, will bring about those laws which will work for the good of the industry, your good, and promote motor highway transportation. You, your employees, customers, their employees, drivers, etc., can be welded into a unit, a machine that will function so smoothly that a glass of water filled to the spilling point will not lose a drop if placed on the engine. First, you must organize, **and now is the time to do it.** Form an organization. Enlist every member of the automotive industry. Take in the dealer, distributor, the salesmen, service men, garage men, tire men, accessory and equipment dealers, passenger car dealers, owners of trucks and cars, employees of all, etc. Forget your personal differences and build up an organization **that will go to the polls next month and vote for the men who are pledged for snow removal and sane automotive laws.**

How It Can be Accomplished

It will be done if "George is let do it." Neither will buck-passing get you anywhere. Let some broadminded, live-wire dealer start the ball rolling by sending out notices, calling by phone and personally on a certain number of dealers. Call a meeting and outline plans for a political organization. Right away I hear some reader sniff and say, "Oh, yes. I can get Tom O'Grady to vote for a Republican. I can see him doing it. Not." Well, if Tommy is a truck dealer and can't be sold on a man who will pledge himself for the industry, whether the candidate be a Democrat, G. O. P., Socialist, Mugwamp, Progressive or Prohibitionist, cannot see that for business reasons he should endorse the right man, why he is hopeless, but a good salesman can sell Tommy if he eschews party lines.

At the conference suggested, appoint working committees on the mail chain letter plan; that is, have each member see other members in the industry and have these appoint others. Get the ball rolling. Pile it up like a snow ball. Then call a general meeting to discuss ways and means. Get the various organizations to send a committee. And, by all means, have the newspaper boys present. If properly handled, the right kind of dope passed these boys of the press, it will make great reading. And the candidates for office will sit up and take notice. Yes, they will do more. They will begin to realize that the automotive industry is organized and that it must be considered. And the average candidate is keen for votes, and it's the vote against him he fears.

Make Them Come Out Into the Open

It is suggested that a candidate or candidates be pinned down so that he cannot sidestep the issue. Outline a snow removal bill, or other bills, and do this carefully. Make the candidate "come through clean," as they say. Assuming that Jones, a candidate for the legislature from your section pledges himself for the bill, pass the word and even advertise the fact that Jones is for the bill and spread the good word. If Jones is pussyfooting, he will not sanction the publicity. If Tommy O'Grady's candidate is not for the bill, why, tell the public so and—you know what to do to him on November 2. Take the entire bunch of candidates, from the governor down to the local alderman or town selectman, and make them declare themselves. It can be done.

Must be State-Wide Campaign

But the efforts will be fruitless unless it is made a state-wide campaign and the **dealers in small cities, towns and villages will have to work** for the rural sections generally control legislative matters. It is in these sections that great effort must be made to educate and influence the farmer vote. And farmers are using trucks in large numbers these days and passenger cars as well. And it is to be assumed that they will appreciate having the roads kept open this winter. It may be logical to jog their memory, to recall the past winters when they were snowbound for days and weeks. And the writer believes that the aid of the rural sections can be enlisted, particularly if the bill for snow removal places the burden and expense upon the State. Local politicians ought to see the advantages of such a bill for might there not be "jobs" for their constituents?

Let's Get Busy and Go

The time is short, too much so, but much good can be accomplished if every dealer will **get busy now.** We cannot expect to effect a 100 per cent organization in the short time that remains, but a start can be made, a good one. Publicity is a great moulder of public opinion and the dealers can make good use of it in the coming campaign. Let every dealer forget personal differences of opinion, business or political, and work with Bill, Tom, George and John in making the automotive industry a factor in the coming elections. By exercising their prerogative, the vote, legislators, aldermen, selectmen and town fathers can be made aware of the fact that there is a new organized minority that has a message for their ears. Let's do it now.

Correcting an Erroneous Impression

To the Editor:

An article printed in the Commercial Car Journal of September 15, taken from the Reo Truck News, would tend to give the impression that the small truck causes less road wear than a large capacity unit.

It is true that a light truck making a single trip over a road does less damage than a large capacity vehicle, but a light truck causes far more road wear than the larger vehicle in making the number of trips necessary to transport the same amount of material. The tests conducted recently by the Bureau of Public Roads at Washington, D. C., show that the 1½-ton truck produces 7,000 pounds road impact pressure per ton of load, whereas a 5½-ton chain-driven truck produces only 4,000 pounds impact pressure per ton of load. This is with both trucks operating at the same speed. However, in order to even approach the hauling economy of the larger capacity truck the 1½-ton vehicle has to travel at a far greater speed, thus increasing greatly both impact pressure and the possibility of accident.

To be sure, much popular feeling has been directed against the larger type of motor truck, but this is the result of failure to realize that the only accurate way to reckon road wear is per ton of material transported. When people realize that any action which curtails the use of vehicles of large carrying capacities greatly increases not only transportation costs but also road wear and road congestion, the popular prejudice against the large capacity units will be abandoned.

The far-sighted passenger car owner must realize that the growth of motor transportation instead of being harmful to his interests will actually be an excellent thing for him, as it will make more and better roads available for his use. Only a small percentage of the people in this country are in a position to benefit from improved highway conditions through the use of passenger cars. But as practically every article of food and clothing makes some part of its journey from producer to consumer in motor trucks, every person in the country is benefitted by the construction of good roads through the improved transportation conditions which it will bring about. The motorist must keep in mind the fact that the government cannot justly lend its aid to a project from which only ten per cent of its people owning motor cars can benefit, and that primarily money spent on roads is for the purpose of improving transportation facilities by taking advantage of the motor truck's proven utility.

R. E. FULTON,
Vice-Pres. International Motor Co.

Motor Truck Survey; Oregon, Washington and Idaho

By A. V. COMINGS

THERE is nothing in ancient or modern history comparable with the tremendous and natural growth of the Pacific Northwest states during the past quarter century. The settlement of Washington and Oregon marked the last step in that grim westward march of the sturdy American pioneer that started soon after the close of the revolution. And that the first white child born in Seattle died but a year or two ago, not yet an old man, shows how really young the country is.

Yet this country that was a wilderness within the memory of many who are living today and that held only a few scattered villages of very little promise almost into the closing years of the last century, there are today great and prosperous cities, in many respects far ahead of cities quite as great and of several times their age, in the east.

As the cities have grown, so has the country back of them. In that territory west of the Cascade range, warmed by the soft airs of the Japanese current, there is little or no winter, though the latitude is that of Maine. And in the arid eastern sections, where rain is little known in the long, hot summers, irrigation has made the land blossom with unbelievable crops, which have become known wherever agriculture is known.

Motor trucks early took their place in handling the vast business of this new and hustling country, and today there are over 11,000 motor trucks, exclusive of Ford units, in use in the states of Washington and Oregon. They enter into every possible use; in the big cities they have nearly displaced the horse, for most of the larger cities are built on hills, and the long grades were killing on horse flesh. Throughout the country they are fast taking a leading part in agriculture, in logging, in road building, and in all the many vocations for which they are especially fitted. Their future in this great section is assured, they need only the intelligent handling of better trained dealer organizations to put motor transportation where it belongs in the life of the community.

Agriculture will be the great outlet for motor trucks in the Pacific Northwest in years to come. Already trucks are being used in constantly increasing number in the varied agricultural work of the country, but dealers say the beginning has hardly been made. With good work horses and mules selling from $500 to $750 per pair, and with alfalfa and other feed at almost prohibitive prices, ranchers are looking more and more to the motor truck to help them in their transportation difficulties. Another big factor that will help bring about wider use of the motor truck is that both Washington and Oregon's choice fruit crops can be handled by motor trucks, on pneumatic tires, with much less damage to the fruit than by wagon, and as a western rancher would rather bruise his person than he would any of his high priced fruit, the pneumatic tired truck is just what he wants.

Service Truck, Loaded With Logs, Going Down Steep Grade Held by Cable to Donkey Engine

Packard Truck on Road Work in Typical Idaho Surroundings

I was told in Portland that of the 2,000,000 boxes of famous Hood River apples shipped from the Hood River valley last year, not more than 100,000 boxes were taken to the shipping points in horse-drawn wagons. The statement was made that over 100 trucks had been sold in Hood River City alone, and the ranchers in that vicinity are pretty thoroughly solid on truck idea.

And just consider that the states of Washington, Oregon, Idaho and Montana produced 29,014,000 boxes of apples last year, or 38,685 carloads. It will take a good many motor trucks to handle that constantly increasing crop each year.

Another big northwestern crop that is going to be a big user of motor trucks in the near future is the wheat crop. According to Secretary Meredith, the wheat crop this year will aggregate 26,000,000,000 bushels. In Eastern Washington and Oregon and in Western Idaho are some of the most fertile wheat fields of the country, and already the motor truck is being used in handling the sacked grain from the field, and in hauling ranch supplies. Some of this wheat land is too hilly for trucks, but much of it is ideal for truck haulage. Most of the harvesting is done by combined harvesters, which cut, thresh and sack the grain at one operation. The sacked grain is then hauled to the nearest elevator or shipping point, the hauling often taking from twenty to thirty days after the harvesting is done, teams and men having to be fed and paid this much longer.

With motor trucks on the job, the sacks may be hauled much quicker to their destination, cutting down this expense materi-

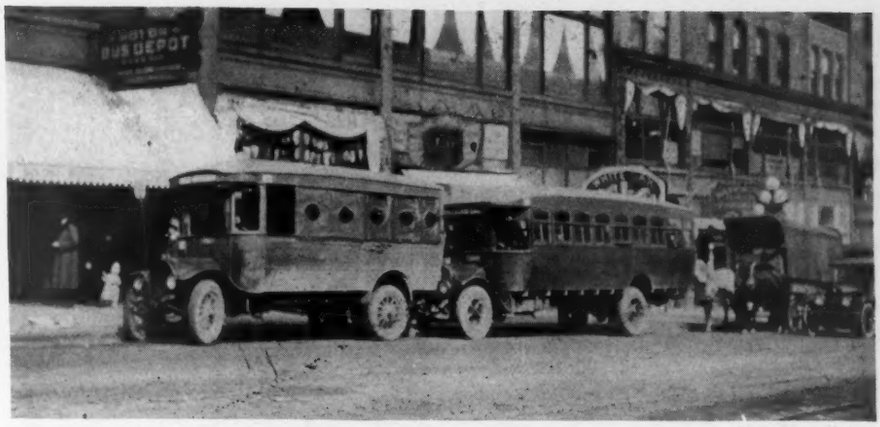
ally. And one big rancher has very successfully tried out a plan whereby the threshed grain is shunted into a hopper type wagon, fastened to an outrigger on the harvester outfit, thereby traveling with it, and this wagon when full is replaced by an empty one as the harvester continues on its way. A 2-ton motor truck then transfers this load from the hopper wagon to its own grain body by means of a mechanical elevator run from a power take-off on the transmission, the truck body being large enough to hold two wagon loads. Two of these trucks are used, and when the harvesting is done on the two sections of wheat land owned by this rancher, his wheat is in the elevator and there is no month of hauling by team, at great expense, as with the other ranchers who do not use trucks.

Two-Ton Trucks Favored in the Wheat Field

Two-ton trucks are at present the principal type used in the wheat fields, and with the extension of better roads through the wheat area a much better sale of trucks will result. Few trailers are used in the wheat belt, as grades are too steep as a rule.

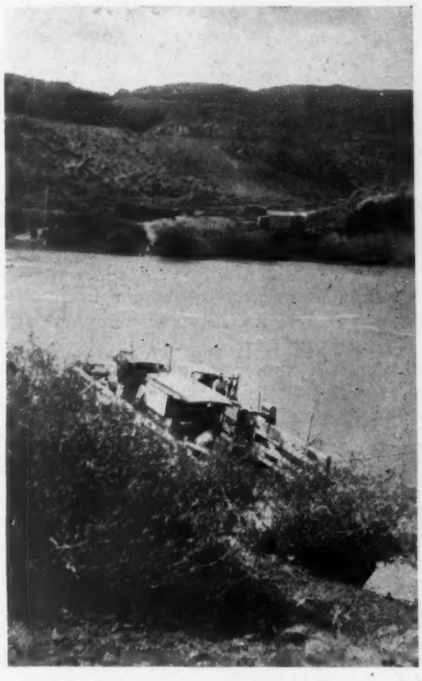
Trucks in the Logging Industry

Up to within a few years ago all timber was taken out of the forests of the Pacific Northwest by horses, donkey engines and logging railroads. A few motor trucks had been tried out previous to the great war. Then came the sudden demand for both aircraft and ship timber, to say nothing of the demand for lumber for building cantonments. And the motor truck was impressed into service all over the timber country, where it has made such a splendid record that today motor trucks are in constantly increased demand for this kind of work. A prominent and successful dealer in Seattle told me that he doubted if one-tenth the amount of timber would be moving out of Washington forests today, were it not for the motor trucks. And another dealer, in Spokane, told me of seeing, at the time of the gasoline shortage, forty big logging trucks tied up at one time in Colville, for want of gasoline. And this in just one little town in a logging section.



Motor Stages Running Out of Seattle

Several factors have contributed to the extended use of motor trucks in logging. Almost prohibitive costs have made it impossible to build logging railroads into new areas, and the gradual extension of good roads has helped the motor truck penetrate nearer the logging centers. And the discovery that first class motor truck "rail ways" could be built with heavy planking through the forests, on which trucks could be used almost as well as on city streets, brought about their increased use.



Trucks Ferrying Across Snake River Near Twin Falls

The result is that all through Oregon and Washington, wherever there is logging going on, motor trucks are fast increasing in number. On the western slope of the Cascade mountains, in Washington, and in the Olympics, where big timber predominates, and down into Oregon, the truck with shorter wheelbase, with a two-wheel trailer, is the usual rig. And these trucks and trailers have to be of the most rugged, tough construction to stand this sort of work. Logs yanked out of the forest are not placed gently on the cross bolsters of the motor trucks. I never yet have seen a donkey engine man who was particularly careful in the way he handled logs. And between the dropping of the logs from above, and the rough going below, the trucks in this service that last may well be considered real, honest-to-goodness motor trucks.

On the east slope of the Cascades, in eastern Washington, a longer wheelbase truck is used, as the logs are cut into shorter units, and usually loaded without a trailer.

In some of the more inaccessible places, logging trucks are hauled up and let down the steeper grades by means of a cable from the donkey engine.

Trucks of the 3½ tons and upward are used in logging operations, the tendency being at present toward the larger sizes in this work. Engines must be of the most powerful, transmissions and axles of the toughest, and frames must be extraordinarily strong, to stand this work, and the truck maker whose output is weak in any one of these particulars will do well to keep out of this field.

There is a big future for trucks in this work, for the Pacific northwest states now hold about one-half the nation's supply of standing timber. Last year 40,024 carloads of lumber was shipped out of the country, and this amount is growing

Diamond T Trucks in Logging Work, Washington

Republic Truck and Trailer, Oregon Logging

annually. With the tremendous demand for lumber for building which must continue for the next decade, there will be a constantly increasing call for motor trucks to help get the timber out.

It is a field worth developing by any manufacturer who has a truck that can stand the gaff.

Motor Buses and Motor Express Lines

Nowhere in the country is there a better organized system of motor truck express lines than out of Seattle. Twenty-one separate individuals or companies, operating nearly 90 trucks, are organized in one joint terminal company, and these trucks, operating on regular schedules, carry express to practically every town and village within a radius of fifty miles of Seattle. This system already has plans for a new and modern terminal building under way, and a big expansion of its service may be anticipated in the next few years.

Spokane has an excellent system of motor truck express to towns in several directions from the city, and a few lines run out of Tacoma and Portland. Scattered individual lines are operated from other points in the two states.

There is room for big development of this type of transportation in the two states, which will doubtless come with the extension of their good roads and the growth of their cities.

No standard size truck is being used in this work, the sizes generally ranging from 1½-ton capacity to 3-ton capacity.

Passenger transportation by motor buses is a growing business that has taken big strides in the past two or three years. Buses make regular trips from Seattle, Spokane, Tacoma, Portland and other more populous areas, to the smaller towns roundabout. Many places in the Pacific northwest that have no rail connection depend entirely on motor buses for their traffic with the outside world. Vast districts of these states are as yet untouched by railroads, so that the motor buses fill a real need. They have been developed to a fine degree, and some even have smoking compartments and toilet accommodations.

The truck of the 2 to 2½ tons capacity is most used in this work, and pneumatic tires are universally used on motor stages.

Dairy Interests Use Trucks

Oregon and Washington are both big dairying states, the mild winters making it possible to feed cows in pasture the year 'round. Some of the biggest milk condenseries in the world are located in Washington, for it is from that state that Carnation condensed milk, "from contented cows," emanates. Practically all this milk is now handled from ranches to the condenseries by truck.

And milk and cream is daily delivered to the big cities, as in the east, by fleets of trucks.

There is a steady and growing demand for trucks in this work, ranging in size from 1½ tons to 2 tons capacity.

Other Truck Uses

About one-fifth of the country's wool clip comes from the four Pacific northwest states, and more and more each year are motor trucks being used to handle this wool to shipping points, and to carry supplies of food, salt, clipping machinery, etc., to the various camps. The average ranches use one-ton trucks for handling the supplies, though some of the larger companies are using 1½-ton trucks in this work.

Mining has received a decided impetus in the Pacific northwest in the past few years, and there has been a fair sale of trucks of 3½-tons capacity and upward to the mines for handling supplies to the various camps.

Spokane, Seattle and Portland all have large packing plants, and already motor trucks are being used, as in the east, to haul stock to these plants. One- to 2-ton trucks are used principally in this work.

In Idaho, south of Nampa and Caldwell, is a tract called the Deer Flats potato belt, where 2,500,000 bu. of potatoes were raised this year. Already there has been a good demand for motor trucks for hauling these potatoes, and more will be sold here in the future. The average haul is from 8 to 10 miles, and trucks are particularly in favor as they can, with their pneumatic tires, go right into the fields after the potatoes.

Irrigation has already extended farm land in the Pacific northwest greatly, and many more projects are coming up that will mean thousands more ranchers, and therefore a constantly growing demand for motor truck transportation. This land is so tremendously productive when once put under water that large crops are immediately available for distribution, and truck dealers throughout the Pacific northwest look forward to a big and constantly growing market with ranchers throughout their territory.

(*Continued on page 34*)

Federal Trucks and Semi-Trailers on Fruit Ranch Near the Dalles, Oregon

EDITORIALS

Trade Association Meetings

NOW that the summer season is over a great many dealer and trade organizations are beginning to hold regular meetings semi-monthly or monthly, as the case may be. Undoubtedly, within the next few weeks these associations will have plenty of interesting, live topics to discuss. Nevertheless, a little advice may be timely; namely, that those who have to do with the running of these organizations should do everything possible to make these meetings instructive.

One of the subjects which should be taken up immediately, is that of legislation; and the used truck problem should also be given early consideration. There are so many subjects which can be discussed to advantage at such trade meetings that it is hardly fair to the members of the association to permit the meetings to degenerate into merely an evening's entertainment. The get-together and good-fellowship spirit is essential and should be encouraged among the dealers but sight must not be lost of the fact that these meetings are called for a more definite purpose. Unless the dealer's organizations are strengthened and the dealers are willing to discuss trade problems and the solution thereof, no advance can be made by the automotive industry and the association might as well not be in existence. A good trade organization can kill the trade-in problem in any city or town, provided it functions anywhere near one hundred per cent. Drastic legislation can also be combated more quickly and with more effect, when the dealer organization is on the job.

Passing the Buck

THE recent speech made by Gov. Harding, of the Federal Reserve Board before the Motor & Accessories Manufacturers' Association should have an encouraging influence on the dealers, especially those who have had difficulty in the past in trying to obtain loans from their banks. Gov. Harding stated, in no uncertain terms, "that it was entirely the business of the local banker to grant or refuse loans and that the Federal Reserve Board or the member banks have no jurisdiction in the matter of making or granting loans."

This statement puts the matter up squarely to the banker. It is up to the dealer to sell the banker, and no dealer should let the banker "pass the buck" to him that the Federal Reserve Board is discouraging loans on trucks or passenger cars.

Gov. Harding's message is also encouraging because he realizes the importance of transportation. While the board has never undertaken to define essentials, it believes that there are four great fundamental essentials: Food, fuel, clothing and shelter; which necessitates to be of use to the nation, must be transported from the farms, warehouses and factories to the ultimate consumer. As the railroad and waterways cannot cope with the situation entirely, is not the motor truck the proper link in the chain which completes our national transportation facilities?

It behooves the motor truck dealer, therefore, to get into closer contact with his banker. The banker has not been sold enough on the automotive industry. He is looking for information but he is naturally, especially now, looking out for his good customers. He is more cautious now than he ever was and, therefore, he wants better reasons for loaning money than he did in the past.

A Few Things to Think About

WITH the change in conditions that are now so apparent in the truck industry the need for better selling organizations is imperative. Selling trucks should appeal strongly and present many attractions to good salesmen. The practice of sending men out into the territory, placing agencies in haphazard manner, placing a number of trucks just to make a good showing with the factory are all practices which must be discontinued. The truck dealer must be considered more in the light of a direct representative of the factory rather than a party who simply is a go-between the factory and consumer, or one who takes the brunt of the overproduction or mistakes made by the factory. Greater attention must be given to the dealer, for instance, by establishing a department at the factory whose duty it is to keep in touch with the dealer and supply sales data and advertising matter also information regarding transportation and delivery costs of the particular truck that he represents. More attention must also be given the dealer in co-operating with him on his service problems. In plain words the dealer must be protected in every possible way as he is the medium which, after all is said and done, controls the growth of the factory.

News of the Trade in Brief

(For Factory Items, Personals, New Incorporations, Etc., See Pages 102-106)

No Tire Price Increase as Yet

AKRON, O.—The contemplated notification by several Akron companies of automobile manufacturers of a 10 per cent increase in tire prices effective October 1 has been abated, at least temporarily, it became known recently. Whether the unexpected visit of Henry Ford to Akron and his return to the city from Canton for conference with several of the city's tire manufacturers had anything to do with the decision to reconsider is not known. Ford, however, while in Akron, conferred at length with H. S. Firestone, of the Firestone Tire & Rubber Co.; F. A. Seiberling, president, and P. W. Litchfield, vice-president of the Goodyear Tire & Rubber Co., and with other officials.

Not all of the Akron rubber companies had entered into the agreement to notify automobile manufacturers of the price increase, it is said. Some were adopting a hold-back attitude to see how the notice was received from those companies which did decide to enforce the new prices October 1. Such increases would not effect consumers or dealers, it was stated, but would only be to manufacturers on contracts for original equipment.

Ford's recent annuoncement of a reduction in the prices of Ford cars may have influenced tire dealers in reconsidering the contemplated increase, it is believed. Ford, while in Akron, stated that the war was over and that prices should come down and not go up. As his factories use about 16,000 tires daily and will require approximately 5,000,000 tires next year, the matter of placing contracts in Akron is said to have depended on whether prices remained the same as last year. Goodyear and Firestone supply the bulk of tires for original Ford equipment.

Harding's Statement Concerning Restricted Credit

CLEVELAND, O., Sept. 16.—The gist of the whole credit situation as outlined by W. P. G. Harding, Governor of the Federal Reserve Board, in an address delivered by him before the Credit Men's Convention and Advertising Managers' Council Meeting of the Motor and Accessory Manufacturers' Association, at the Hotel Statler, is to the effect that the Federal Reserve Board and the Federal Reserve Banks have not made any attempt to define essentials, nor to dictate what any member bank shall do in the matter of loans. **The matter of granting loans** to the individual or to the firm or corporation is one **which is entirely in the hands of member and non-member banks** with which these people deal.

"Nothing has been done by the Federal Reserve Board," said Governor Harding. "that reflects in any manner upon one of the greatest industries in the country. It would be a serious thing for any body of men to attack or to attempt to destroy a business as firmly rooted and having as many elements of essentiality as the automotive industry. So far as the Federal Reserve Board is concerned, no such attempts have been or will be made."

Mr. Harding said that the dissemination of the reports that the board had ruled against the industry were probably due to the natural reluctance of some bankers to say no to an applicant for credit when it might mean the loss of an account. On investigation, he said, it had been found that many bankers had followed the lines of least resistance and had "passed the buck" to the Federal Reserve Board.

Coming Events

October 16 to 26, 1920—Atlanta, Ga. Fifth Annual. John Lothridge, Mgr., 264 Peachtree St. Passenger Cars, Trucks & Accessories.

October 16 to 26, 1920—Atlanta, Ga. Southeastern Fair Assn., Fifth Annual Fair. Atlanta Auto Assn., Managers of Show, 305 Connolly Bldg.

October 18 to 23, 1920—Raleigh, N. C. Fifty-ninth Annual State Fair. Passenger Cars, Trucks, Tractors. Joseph S. Pogue, Sec'y.

October 18 to 23, 1920—Jackson, Miss. Seventeenth Annual State Fair. Passenger Cars, Trucks, Tractors. Mabel L. Stire, Sec'y.

October 19 to 24, 1920—Dallas, Texas. Thirty-fourth Annual State Fair. Passenger Cars, Trucks, Tractors, Accessories. W. H. Stratton, Sec'y.

October 28 to November 6, 1920—Macon, Ga. Sixty-fifth Annual State Fair. Passenger Cars, Trucks, Tractors. Harry C. Roberts, Sec'y.

October 30 to November 6, 1920—Long Branch, N. J. Sixth Annual Auto Show. Ocean Park Casino. S. M. Heimlick and H. W. Schuyler, Show Managers. Passenger Cars, Trucks, Tracors & Accessories.

October 30 to November 14, 1920—Waco, Tex. Eleventh Annual Cotton Palace Exposition. Passenger Cars, Trucks, Tractors. S. N. Mayneld, Sec'y.

November 7 to 12, 1920—Lewiston, Idaho. Twelfth Annual Northwest Livestock Assn. Fair. Trucks and Tractors.

November 8 to 13, 1920—Phoenix, Arizona. Sixteenth Annual State Fair. Passenger Cars, Trucks, Tractors. Shirley Christy, Sec'y.

November 14 to 21, 1920—New York. Automobile Salon, Hotel Commodore, Auto Salon, Mgrs., 785 Fifth Ave., New York.

November 15 to 20, 1920—Chicago, Ill. Annual Show Automotive Equipment Assn. Coliseum. A. B. Kauffman, Mgr.

November 15 to 20, 1920—Jersey City, N. J. First Hudson County Auto Show. Fourth Regiment Armory. Passenger Cars, Trucks, Accessories. Fred W. Payne, Mgr., Grand Central Palace, New York City.

November 18 to 27, 1920—Jacksonville, Fla. Fourth Annual State Fair and Exposition. Cars, Trucks, Tractors. B. K. Hanafourde, Sec'y.

November 30 to December 3, 1920—St. Louis, Mo. Coliseum. Third Annual Exhibition of National Hardware Association of the United States. Accessories. T. James Fernley, Sec'y-Treas., 505 Arch St., Philadelphia, Pa.

January, 1921—Spokane, Wash. Fourth Annual Auto Show (probable). Edgar M. Stock, Mgr., 822 Old National Bank Bldg. Passenger Cars, Trucks & Accessories.

January 3 to 8, 1921—New York City. Motor Truck Show at 12th Regiment Armory. Motor Truck Assn. of America. T. D. Pratt, Gen. Mgr., 1790 Broadway.

January 16 to 22, 1921—Schenectady, N. Y. Company E, F and Machine Gun Co., State Armory. J. J. Callahan, Mgr., Box 1186, Pittsfield, Mass.

January 22 to 29, 1921—Cleveland, Ohio. Twentieth Annual. Wigmore Coliseum (100,000 sq. ft.) Fred H. Caley, Mgr., Hollenden Hotel. Passenger Cars & Accessories, only.

January 23 to 29, 1921—Amsterdam, N. Y. State Armory. J. J. Callahan, Mgr., Box 1186, Pittsfield, Mass.

January 29 to February 5, 1921—Chicago, Ill. Coliseum and First Regiment Armory. Passenger Cars & Accessories.

January 30 to February 5, 1921—Hudson, N. Y. State Armory. J. J. Callahan, Mgr., Box 1186, Pittsfield, Mass.

February, 1921—Nashville, Tenn. Allen Parkes, Mgr., Care Chalmers Company of Tennessee.

February, 1921—Wilmington, Del. Sixth Annual. E. C. Ulrich, Mgr., Tenth & French Sts. Passenger Cars & Accessories.

February 5 to 12, 1921—Minneapolis, Minn. Winter Show. Walter R. Wilmot, Mgr., 709 Andrus Bldg.

February 7 to 12, 1921—Columbus, Ohio. National Tractor Show, State Fair Grounds. W. W. Whaley, Springfield, Ohio, Gen. Mgr.

February 12 to 19, 1921—Kansas City, Mo. Fourteenth Annual Auto Show. E. E. Peake, Mgr., 1019 Floyd Bldg. Passenger Cars, Trucks & Accessories.

March, 1921—Seattle, Wash. Third Annual. Wm. J. Coyle, Mgr., 1321 Seneca St. Passenger Cars, Trucks & Accessories.

March 7 to 12, 1921—Indianapolis, Ind. Twenty-second Semi-annual Show. John B. Orman, Mgr., 338 North Delaware Ave. Passenger Cars, Trucks, Accessories & Farm Lighting Outfits.

March 7 to 12, 1921 (Probable date)—Paterson, N. J. Fifth Annual Auto Show, Fifth Regiment Armory. Passenger Cars, Trucks, Tractors & Accessories.

March 15, 1921—Fort Worth, Tex. Twenty-fourth Annual Southwestern Exposition & Fat Stock Show. Passenger Cars, Trucks, Tractors. M. Sansom, Jr., Sec'y.

March 20 to 26, 1921—Torrington, Conn. Company M, State Armory. J. J. Callahan, Mgr., Box 1186, Pittsfield, Mass.

Date Undecided—Evansville, Ind. Eleventh Annual. J. F. Frohbieter, Sec'y., 130 First Ave. Passenger Cars, Trucks, Tractors & Accessories.

CONVENTIONS

Atlantic City, N. J., October 22 to 25, 1920—Twenty-seventh Annual Convention National Implement & Vehicle Assn., Traymore Hotel.

Chicago, Ill., November 15 to 20, 1920—Automotive Equipment Assn. Coliseum. A. B. Kauffman, Mgr.

Chicago, Ill., January 31 to February 1, 1921—Annual Meeting N. A. D. A.

Chicago, Ill., February 2, 1921—Winter Meeting Society of Automotive Engineers, Hotel Morrison.

Cincinnati, Ohio, December 8 to 10, 1920—Ohio Automotive Trade Assn. E. J. Shoyer, Sec'y, 404 Central National Bank Bldg., Columbus, Ohio.

Detroit, Mich., November 18, 19, 20, 1920—Annual Meeting, National Association of Motor Truck Sales Managers.

Los Angeles, Calif., October 1920—Southern Division, California Automobile Trade Association.

Minneapolis, Minn., January 11 to 13, 1921—Annual Convention of the Minnesota Implement Dealers' Association, West Hotel. C. I. Buxton, Sec'y, Owatonna, Minn.

Nashville, Tenn.—November 12 to 14, 1920. Tenth Quarterly Meeting, Southern Automotive Jobbers' Assn.

New York, January 11 to 13, 1921—Eleventh Annual, Society of Automotive Engineers, Hotel Astor.

FOREIGN EVENTS

Buenos Aires, Argentina—November, December, 1920—National Exposition of United States Manufactures.

Brussels, Belgium—December 10 to 19, 1920—First Post-War Show, Palais du Cinquantenaire, auspices Chambre Syndicate de l'Automobile.

Ceylon, India—January 22 to 29, 1921—Automobile Show, auspices Ceylon Motor Show Syndicate.

London, England—October 15 to 23, 1920—Commercial Vehicle Show. November—Passenger Car Show, Olympia.

Sydney, Australia—January 7, 1921—Australian Motor Show.

Utrecht, Holland—Spring, 1921—Fifth Annual Industrial Fair, with International Exhibits.

Bankers Class Trucks as Essentials

Opinions from several of the country's banking institutions show that the banks apparently recognize the importance of the motor truck in the nation's immediate transportation program, in spite of the fact that urgent efforts have been made in some sections to cut down financing of passenger car buying.

In commenting on the importance of the truck and the willingness of financial interest to indorse the purchase and use of motor trucks, a prominent metropolitan banker said:

"We are able to advise you that in no case has this bank advised its motor truck customers to reduce their loans for the reason that we do not look on this industry as being in the non-essential class. We appreciate fully the value of motor truck transportation in the present serious freight congestion and therefore treat it as a necessity."

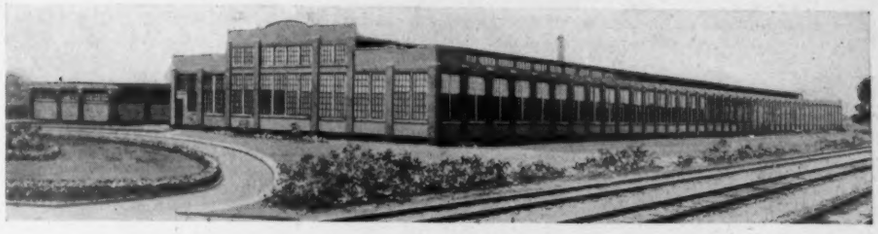
Said another banker: "With the railroads facing a shortage of equipment and taking into consideration the fact that the truck offers a haulage economy and touches many points off the usual main lines of transportation, thus being essential to food producers, one cannot doubt that the motor truck has won its place as a stable commodity and is a compelling factor in our transportation problems. It therefore cannot be classed as a luxury."

Several other opinions of the same nature have been given by bankers throughout the country.

Clark Battle Creek Plant Almost Completed

The new Battle Creek plant of the Clark Equipment Co., Buchanan, Mich., which has been under construction since March 1st is almost completed and the work of "tooling up" the plant for the manufacture of Clark axles will soon be in progress. Much of the machinery has been purchased and is ready for installation. This plant will be used for the manufacture of Clark motor truck axles.

The plant's site comprises 23 acres with a 4600 ft. frontage on the main line of the Michigan Central Railroad and a smaller frontage along the Grand Rapids and Interurban Railroad. It is located on the extreme western side of the city. The manufacturing building is 99 x 440 ft. and the warehouse parallel to it is 50 x 144 ft. The two buildings are connected by two closed passageways. A third building houses the power plant.



New Battle Creek Plant of the Clark Equipment Co.

All sales, engineering, purchasing and general administration, will be handled as before through the general offices at Buchanan, Michigan. The same progressive policies of plant management and profit sharing, that proved so valuable at Buchanan, will be put into force at the Battle Creek plant.

This new manufacturing unit puts the company in a position to supply the increasing demands from manufacturers for Clark Axles. This company manufactures a complete line of internal-gear-drive truck-axles from three-quarters to five tons capacity, and all sizes of steel disk wheels for solid and pneumatic truck tires.

Syracuse Automotive Association Meets

At the monthly meeting of the Automotive Service Association, of Syracuse, N. Y., held on the second Thursday of September, announcement was made that the membership included 20 service managers and 6 proprietary members. Plans were perfected for a membership drive, then local matters will be taken up.

The officers of the association, which has adopted a constitution and by-laws similar to those in use by the New York association, are: C. Fred West, president; M. R. Potter, vice-president; E. F. Fuller, treasurer; H. H. Smith, secretary. The last named is executive secretary of the Syracuse Automobile Dealers' Association. Meetings are to be held throughout the winter, at which local service problems will be discussed. The association has endorsements of dealers' organizations.

Lawbreaking Driveaways

The N. A. D. A. has issued a very timely and sensible bulletin urging care in the selection of driveaway crews. Speed violations of law by convoys of cars mean mechanical troubles for the prospective owner. Excessive speeds have already roused communities to righteous ire, and it is predicted that a continuance of such nuisances for the next six months will result in legislatures prohibiting by law the passage of convoys over the roads of the States. Heavy fines and imprisonments are certain if the lawbreaking continues. The bulletin advises the expenditure of a little more money, if necessary, to insure suitable men as pilots and drivers.

The industry as a whole is surely experiencing enough difficulties with the public and law-making bodies as matters stand now, without deliberately going into the highways and byways and inviting further criticism by the utter disregard for the rights of others.

Donovan Wins Republic Scholarship

The $1000 university scholarship offered for the best essay on "Ship by Truck and Good Roads," by the Republic Truck Sales Corp., of Alma, Mich., was awarded to John M. Donovan, Jr., of Turners Falls, Mass. Over 20,000 essays were reviewed by the committee appointed by Commissioner of Education Claxton of the Department of the Interior. Donovan, in his prize-winning essay, revealed an unusually keen perception of our economic requirements, and highway transportation.

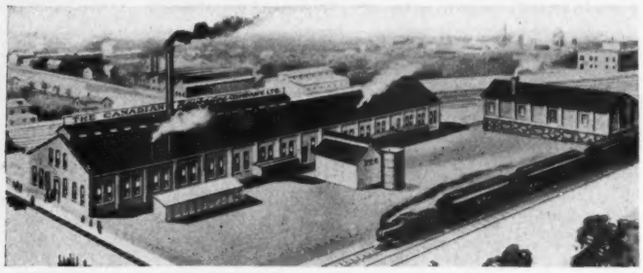
Federal Tire Sales Representatives in Annual Convention

Sales policies for 1921 and problems confronting the automobile tire industry and automotive industry in general were discussed at the annual Sales Convention of salesmen and warehouse managers of the Federal Rubber Co., Cudahy, Wis. The convention, which opened on September 20th, continued for four days. It brought together the 150 sales representatives and managers who represent the Federal Rubber Company's contact with the public. The convention, in addition to promotion of sales policies, took up at length Federal's new advertising program.

Raybestos' Canadian Subsidiary Company is Now in Operation

The Raybestos Company, Bridgeport, Conn., realizing the importance of the Canadian market, last spring organized the Canadian Raybestos Company, Limited, with a capital stock of $250,000. This subsidiary company has recently begun the manufacture of brake lining, molded facings and other products in its new plant at Petersborough, Ontario.

The Canadian Raybestos Company, Limited, purchased the Lundy Tool and Shovel factory at Petersborough and remodeled it to receive looms and other machinery, which were shipped as soon as the building was renovated.



Canadian Subsidiary Company of the Raybestos Co., Bridgeport, Conn.
It is located in Petersborough, Ontario, near a large asbestos mining center.

That the highway program in Canada, which contemplates the expenditure of $50,000,000 within the next five years, and the probability that there will be over 400,000 automobiles in Canada before the end of the year are factors that will greatly enhance the valuability of the new infant concern to its parent organization is fully appreciated, particularly, in view of the fact that it has a closed national relation to the Canadian people because of the propinquity of the plant to them.

Proximity to the Canadian asbestos mines, from which come the best spinning fibres, and of whose total output the Raybestos Company takes fully 40 per cent, may lead Canadian Raybestos to set up a spinning department in addition to the manufacturing plant at Peterborough.

Machinery for the new plant was shipped from Bridgeport. Plant improvement and new buildings, however, were by Peterborough labor. Included in the improvements are a sprinkler system, modern heating plant, concrete floors, new plumbing and a new roof. Within a year it is hoped that 175 to 200 men will be employed by Canadian Raybestos.

The officials of the Canadian Raybestos Company, Limited, who are all connected with the Bridgeport organization, are: President, Sumner Simpson; vice-president, Howard C. Simpson; secretary and treasurer, Robert Abbott; directors, the above and L. V. Simpson and Morton F. Judd. Mr. Abbott is the manager of the Canadian factory and has taken up his residence in Peterborough.

Canadian sales headquarters are at the factory and Henry Ervin is in charge. Both Mr. Abbott and Mr. Ervin served overseas during the war.

Owing to the increased popularity of the profession of tire surgeon, the tire repair school of the Miller Rubber Company, Akron, Ohio, has increased its capacity 50 per cent.

Trailer Factories Reported Busy

Members of the Trailer Manufacturers' Association of America held an all-day session in Cleveland recently, following a meeting of the executive committee the preceding day. Application for membership by Wentworth & Irwin, trailer manufacturers in Portland, Ore., was unanimously approved, making the membership now twenty-three. The Reliance Trailer & Truck Co., of San Francisco, was also recently admitted.

Reports showed that the manufacturers still have a considerable volume of unfilled orders on their books that would keep the factories busy for one to two months and that after a temporary lull, new orders had begun to come in toward the first of the month. Foreign orders have been coming in at a good rate.

There were addresses and discussions on various topics of interest to the manufacturers, including cost accounting in the factory by Mr. Bixby, of Ernst & Ernst, of New York, standardization of trailer construction, reduction in the number of trailer models, legislation, patents and service. It developed that several members had already reduced their models materially, one maker having reduced from 48 to 12 in the present year.

A committee on standardization was appointed to investigate the feasibility of standardizing axle dimensions and investigate and report recommendations for a standard pintle hook for coupling trailers to motor trucks. The patents committee was instructed to bring in recommendations regarding the patent situation at the annual meeting to be held in New York in January.

The meetings approved a design for the slogan "Truck by Trailer," adopted as the official slogan.

It was voted unanimously to double the initiation fee and annual dues in the association beginning the first of the new year.

The 40 per cent freight rate increase that is expected to put the railroads on their feet and the heavy increase in express rates will work no hardship on the trailer business. While they will add to the cost of parts and materials and to the freight bills on finished trailers, they will cause industrial and commercial concerns to turn more and more to motor trucks and trailers for short-distance hauls.

The heaviest increases are on the short hauls. An increase of $3 to $5 a ton means a total of $30 to $50 on a 10-ton shipment. This can be handled in one trip with a 5-ton trailer at a material saving in cost and also in time.

Missouri Tour Boosts State's Good Road Movement

The St. Louis-to-Kansas City caravan of the United States army trucks, touring cars and ambulances left St. Louis at noon Monday, Sept. 27, for its five weeks' cross-country tour in the interests of the $60,000,000 bond issue for good roads in Missouri, to be voted upon November 2.

The St. Louis caravan will end its run in Kansas City on October 26 after traversing all counties south of of the Missouri River, while a similar caravan of trucks, which left Kansas City on the same date will wind up its trip in St. Louis at the same time, after making all counties north of the river.

The expedition had been scheduled to start at 9 A. M., but was delayed because eight additional trucks expected to join, from Camp Grant, Ill., were mired somewhere between Springfield, Ill., and St. Louis, and a late train delayed the arrival of the sixteen-piece band from the Great Lakes Naval Training Station, which had been arranged to accompany the caravan. It was finally decided to go ahead, leaving the Camp Grant trucks to overtake the party later.

In line were five trucks, two army motor ambulances, two army touring cars and a motorcycle side car. The procession was led through St. Louis previous to its departure by a car bearing Mayor Henry F. Kiel and Major Harry B. Hawes, president of the Missouri Good Roads Federation. The War Department at Washington co-operated in the "Good Road" movement to the extent of furnishing the trucks, soldiers and camping equipment, which was used by the entire personnel of both the St. Louis and Kansas City expeditions.

During the entire tour the St. Louis caravan visited approximately 150 towns in its 800-mile hike, holding meetings, with band concerts and speeches, in over 60 towns.

Under the arrangements with the War Department the army was permitted to do recruiting work after the road meetings, which were addressed by selective speakers, who were relieved weekly, and who were under the command of M. R. Sturdevant, chairman of the Speakers' Committee of the Good Roads Federation. None of the tourists were permitted to stay at hotels. The tents and other equipment for pitching regulation camps were taken along in order to give the young men out in the State a conception of a real bivouac.

The entire tour was under the direction of the Missouri Good Roads Federation, the itinerary, controls, etc., having been worked out by Harry P. Mammen, of the Traffic Motor Truck Corporation, who is chairman of the Federation's Tour Committee, in conjunction with Judge Raymon A. Walsh, secretary of the organization, and Robert E. Lee, secretary of the St. Louis Automobile Manufacturers' and Dealers' Association.

The highway engineers in each county through which the trucks passed acted as pilots from county line to county line. They have been instructed in their duties by John McK. Southgate, chairman of the Engineers' Committee of the Federation.

Big Attendance Greets Federal Highway Council

The Automotive Industry Was Well Represented at the Council Meeting

AKRON, O., Oct. 8.—To effect a more efficient, economical and practical common carrier service in the United States, a transportation conference was recently held in this city at the call of the Federal Highway Council. Highway officials from practically every section of the country were in attendance.

One of the most serious phases of road development, that of sub-grade and its relation to the road surface, came before the conference, under the leadership of C. M. Upham, state highway engineer of Delaware.

Throughout the entire session lasting two days, due credit and appreciation was given the railroads for the work performed; at the same time expressing a determination to make a larger and more extended use of the motor vehicle through the construction of better roads.

The sub-committee on "Motor Truck in Terminal Work," after thoroughly discussing the situation concerning the usefulness of the truck in this work, recommended "that the Federal Highway Council urge upon local Chambers of Commerce and similar commercial organizations in all cities, an intensive study of the applicability of the motor transportation to terminal requirements. It is assumed that such local commercial bodies will include all local interests concerned in terminal work. The question concerns carriers by railways, waterways and highways; public authorities representing highway maintenance and highway traffic control; consignees who pay the freight; commercial interests who develop the traffic strategy of a city, and operatives. The idea to be inculcated is that of an activity of large public import affecting every element of community interest."

The sub-committee on "Store Door Delivery" made recommendations for "relieving that part of the terminal congestion caused by cartage difficulties by inaugurating some system of immediate delivery to the consignee of incoming L. C. L. freight."

The sub-committee on "Motor Truck and Trailers in Short Haul Work" gave this subject of the greater use of motor trucks and trailers in short haul service careful consideration but on account of the wide field for discussion the committee only reported progress and asked for further time in which to secure data pertaining to costs, convenience or more expedited service that could be afforded by such use.

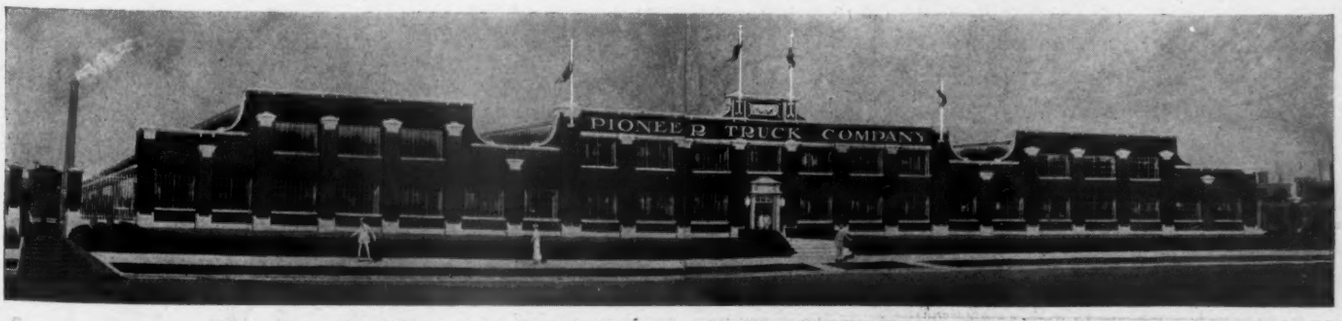
The committee on "Rural Motor Express" covered many subjects, including franchise, insurance, receipts and bills of lading, marketing, returned loads and motor trucks on the farm.

This committee recommended that a thorough investigation be made to consider the ways and means of providing regulation and protection of this means of transportation. The insurance question will be handled by conferring with insurance companies as to the possibility of issuing a standard uniform insurance policy covering motor truck transportation. Tom Snyder recommended "that the term Return Bureau be discontinued and that the term Transport Clearing House, or Transport Bureau be used instead." It was agreed by this committee that "Rural Motor Express" and the "Motor Truck on the Farm" were two distinct expressions of motor transportation. Rural Motor Express is a definite scheduled motor transport conducted by an operator as a regular business upon whom the farmer can depend weekly, bi-weekly or daily service from from his door to the city market. The Motor Truck on the Farm is one which is used for the exclusive use in farm hauling."

The sub-committee on "Highway Transport Survey" recommended that questionnaires be forwarded to all states to see what each is doing in connection with conducting traffic census and highway transport surveys.

The sub-committee on "Traffic Control" proposed that legislation should be enacted in each of the several states with a view to establish a uniformity of highway transport operation, using the proposed Uniform Vehicle Law as the basis upon which the various laws should be established.

The sub-committee on "Snow Removal" recommended that data be collected and distributed on the economic value of snow removal and that State Councils in the several states in the snow belt, organize committees to work in co-operation with this committee.



View of the New Plant to be Built in Valpariso, Indiana, by the Pioneer Truck Company

Plans and specifications for the new Pioneer plant have been completed and from present indications production will be commenced in this city within thirty days. Mr. Otto M. Freier, president and Mr. Richard Vogel, secretary, stated that operations will be started on the first 100 x 300 unit just as soon as the Chamber of Commerce has decided on one of the four sites it has in view, which will be decided shortly. This new building, which will be located in one corner of a ten-acre site, will be immediately followed by another unit of like size when the first is completed. As each unit is constructed another will be started including a foundry and power plant until six units have been completed, which will then put the Pioneer Truck Co. in a position to manufacture their trucks complete. After all units have been finished, it is estimated that they will employ from 800 to 1000 employees.

Motor Truck Survey

(*Continued from page 28*)

Washington has a very excellent good roads system well under way, and is constantly enlarging it. Oregon is somewhat behind, but has made a start and recently, through a change in its constitution, secured $20,000,000 more to use on roads. Within two years the entire 350 miles of its Pacific highway, running north and south through Portland, will be paved, and this, with the fine Columbia River highway, running east and west, will give the state two fine trunk lines through its most populous sections, which may be used extensively by trucks.

Personally, I believe that some time in the future motor trucks will act as feeders to a line of freight steamers up and down the Columbia, but that time has not arrived yet. The plan holds splendid possibilities, however.

Road work is already using many trucks of 3½-ton size, and there is a fair demand for trucks for contract work of this type. Wood dump bodies, well made in local shops, are very much used on the coast, though some steel bodies are used also.

Get Hard Usage

In eastern Washington and Oregon and western Idaho motor trucks get very hard usage. This is principally in the wheat country. The roads are very rough, and the soil is of a very fine, light volcanic ash. Trucks are continually enveloped in a cloud of this fine dust, which gets into bearings, into engines and everywhere that it ought not to be. The result is that a truck rapidly deteriorates unless an air cleaner is used on the carburetor and other precautions are taken. Provision for this protection should be made on trucks going into this section.

Dealers in the Northwest

Practically all truck dealers in the Pacific northwest states handle passenger cars also. There are few exceptions. A fair reflection of conditions is the fact that in Portland a short time ago 77 different makes of motor trucks were represented by dealers. And "dealers." Of this number not over ten could be classed as dealers who really understood the modern methods of selling transportation by motor trucks, who maintained real service facilities, and who transacted business on the right basis.

Three of these dealers did 55 per cent of the business.

Among the better type of dealers competition is clean and business is sound. Prices are maintained and business is conducted at a profit. With the curbstone type of dealers there are the usual curbstone practices—long terms, bad trade-ins, no service.

Conditions have bettered in Portland in the past few months, however, though at present this community is feeling the slowing down of sales as in other parts of the country.

Dealer conditions in Portland are paralleled in Seattle and in Spokane.

Most truck lines distribute out of both Seattle and Portland. Seattle territory extends southward to the lower tier of counties along the Columbia, and eastward to Spokane and into northern Idaho. Portland territory covers all of Oregon, the southern tier of Washington counties, and western Idaho. Southeastern Idaho is handled from Salt Lake City.

There are few real truck dealers in the smaller cities and towns. Usually the truck is handled as a "side line" by passenger car dealers or garage men, and there is little real sales effort put forth. There is a chance for education among the smaller dealers, along all lines.

The Future

Great as the Pacific northwest has grown in the past two decades, its future holds hope of even greater things. Population is flowing westward in a steady stream, and the great cities of this section are growing greater every year. Seattle almost rivals San Francisco, Portland is reaching out each year beyond its previous limits, Tacoma forges on, and Spokane, though showing no increases in population, has been far from standing still commercially.

The entire country is getting on a sounder, more stable basis, and business conditions there for the next few years should be excellent.

Crops this year in the Pacific northwest have been wonderful, the wheat crop especially taxing the ability of the country to handle it. There will be plenty of money there this winter to buy motor trucks, and dealers look forward to 1921 as the biggest truck year they have ever had.

Wood Wheels *vs.* Disk

To the Editor:

The article written by C. T. Meyers regarding "Wood wheels for motor trucks equipped with pneumatic tires," in the August number of Commercial Car Journal, is noted with interest. I quote a paragraph:

"In the second place the wood wheel stands in the same relation to the other chassis parts as the fuse plug stands to the wiring and apparatus in an electric circuit or as a cylinder head stud stands in the cylinder and its parts in a locomotive. It will break under the excessive side load due to a bad skid and in so doing saves the other parts which are much more expensive and difficult to repair, for the wood wheel is comparatively cheap and quite easy to replace."

I earnestly advise everyone interested in wheels to read the whole of the above article as it lays great stress and rightly so, upon the fact that wheels should not be considered as an efficient tool to smash up the rest of the chassis but should on the contrary act as a shock absorbing medium.

We, as single disc metal wheel manufacturers, and upholders of the claim that that is the only way to construct a metal wheel, heartily subscribe to and agree with Mr. Meyers' conclusions because our single disc wheels act just exactly as the wood wheels do in cushioning impact due to a bad side skid.

With this important exception, however, that whereas the wood wheel breaks and collapses under overload the single disc wheel simply bends and still supports the vehicle.

We are particularly proud of achieving this result because the wood in wood wheels is created by nature as a very flexible substance. The mild steel used in single disc wheels is an artificial substance of greatly inferior elasticity to wood and that it can be so fashioned as to duplicate in even higher degree the elasticity of wood is a very much greater achievement than the mere using of a natural product.

Below are comparative test figures of a wood wheel and a single disc wheel. Tests were made by mounting wheel on a very rigid fixture and applying pressure at one point on side of rim. Wheels mounted on axle with tires would, of course, take much more than these figures show.

Wood Wheel 32x4			Steel Wheel 32x4	
Deflection	Set	Load Lbs.	Deflection	Set
.0625	.000	500	.000	.000
.1875	.0781	1000	.156	.000
.3125	.0625	1500	.250	.000
.4375	.0937	2000	.343	.005
.6562	.1125	2500	.406	.015
.8750	.2187	3000	.500	.047
1.250	.3437	3500	.656	.125
4.000	1.9375	4000	.937	.312
Failed just before the 4000 lbs.		4500	3.875 Failed just before 4500 lbs.	2.875
Four spokes broken, two pulled out of felloe.			Bent only, no cracks or loosening of disc from rim.	

There is one statement in Mr. Meyers' article, however, which anyone at all posted must take issue with. He is taking the virtues which exist in such wood wheels as the Ford, Franklin and other light passenger cars which have real spokes in the wheels and claiming these virtues for truck equipment.

On truck pneumatic equipment the wheel diameter is so small and the hub and flange diameter so large; the length of the spoke becomes so short that on the rear, with the heavy steel brake drum 16 in. to 21 in. diameter, bolted direct to the spokes there is no chance whatever for the wood spokes to function as shock absorbing mediums. So, on these truck rear wheels the single taper dished disc of mild steel will show an elasticity give and recovery superior to the wood wheel, as the entire disc between rim and hub flange has full uninterrupted chance to deflect.

This whole subject is very timely at present, owing to the introduction of the single disc wheel, the single disc wheel is the cheapest to manufacture taking less labor and material than any other type, and second, when built it is a non-rigid and yielding wheel and can yield without injury to itself.

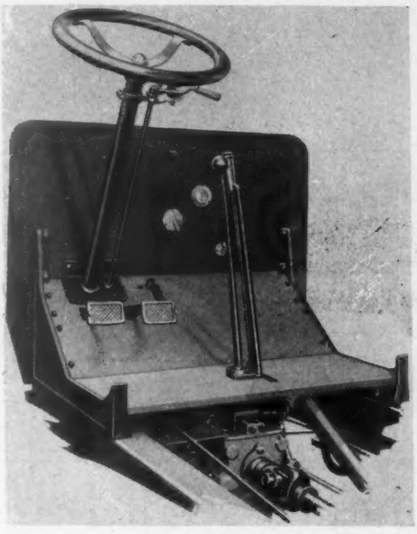
A. L. PUTNAM,
Research Engineer,
Detroit Pressed Steel Co.

NEW COMMERCIAL CARS

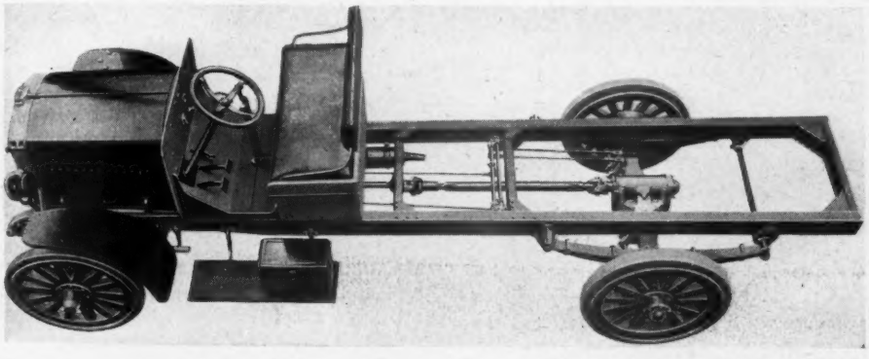
Advance-Rumely Enters the Truck Field With a Farm Model

CLOSE contact with the needs and requirements of the multitudinous demands of farm service in the form of hauling by the Advance-Rumely Thresher Co., La Porte, Ind., has resulted in the bringing out of the company's first truck. It is known as the Model A 1½--ton Rumely truck. It is the intention of the company to distribute this truck through the vast Advance-Rumely dealer organization.

This truck is the result of years' experience in solving farm-power machinery problems, and will broaden its line which includes OilPull tractors and Ideal separators. This entire truck is claimed to be especially designed for farm service, provisions having been made for substituting pneumatic tire equipment and adding a power tire inflating pump on the transmission if desired over the regular equipment. It has a unit-power-plant with a heavy-duty engine, three-speed transmission, and dry-disk clutch. Other features are the large cooling capacity of the radiator, worm-drive rear-axle, extra heavy springs and extra heavy frame.



Showing the Disposition of the Steering Column and Control Levers on the New Advance-Rumely Farm Truck



Bird's-Eye View, Showing General Layout of the Model A One and a Half Ton Rumely Farm Job

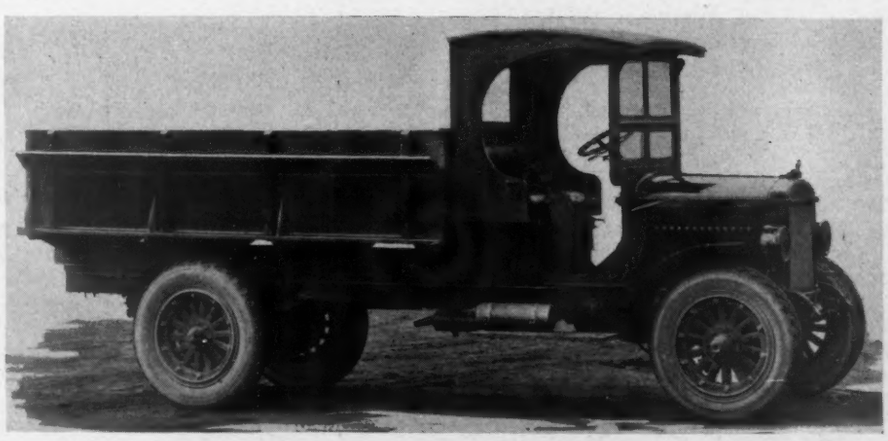
The standard body, which is furnished as extra equipment, is a grain type express body suitable for hauling grains, such as wheat, shelled corn, etc. This body is also provided with suitable extensions which will give it the required larger capacity for hauling oats, barley, etc., live stock, baled hay and other farm products.

The heavy-duty four-cylinder engine, which is cast in block, has a bore and stroke of 3¾ and 5¼ in., respectively. It has a removable head, fully enclosed valves, and is suspended from three points. The S. A. E. rating is 22½ hp. The crankshaft, which is made from open hearth steel, heat-treated, rotates from bearings measuring 2⅞ x 1⅞ in. diam. front, 2¾ x 2 in. diam. center, and 3½ x 2⅛ in. diam. rear. Ignition is through a high tension magneto with an automatic impulse starter. Gasoline is fed by gravity from a 19-gal. tank located under the seat. A centrifugal type governor automatically controls the speed of the engine to 15 m.p.h. for solid tire and 20 m.p.h. for pneumatics.

A full force-feed system of lubrication is employed, the crankshaft, camshaft and main connecting rod bearings being thoroughly lubricated by a gear pump located in the oil reservoir. Pistons, piston pins and cylinders are lubricated by splash-oil thrown up by the connecting rod. A high pressure lubricating system is used for delivering grease to universal joints, spring shackles, and other inaccessible bearings. The cooling system includes a tube-type radiator equipped with a shroud to insure perfect air circulation and a fan mounted on roller bearings and driven by a wide leather belt, easily adjustable. Cooling water is circulated through this system by a centrifugal pump.

From the engine power is transmitted through a dry-plate, multiple-disk clutch having extra large friction surface and requiring no lubricating oil, to a three-speed transmission. The power in being carried from the engine to the rear-axle passes through a propeller shaft equipped with a triple-universal-joint-assembly having an intermediate bearing to prevent whipping of the drive shaft at high speed. Final drive is through a worm-drive, semi-floating type rear-axle with a gear ratio of 7.1:1 and 6.5:1.

The front axle is drop forging of the conventional "I" beam section 2 x 2¾ in. fitted with taper roller bearings.



This Pneumatic-Equipped Truck With Special Convertible Farm Body is Adaptable to All Manner of Farm Service

The service and emergency brakes on the rear wheels are both of the internal expanding type. Under normal conditions either service or emergency brake will lock the rear wheels under full load. Steering is through a steering gear located on the left side and which has an 18-in. hand wheel mounted on its column.

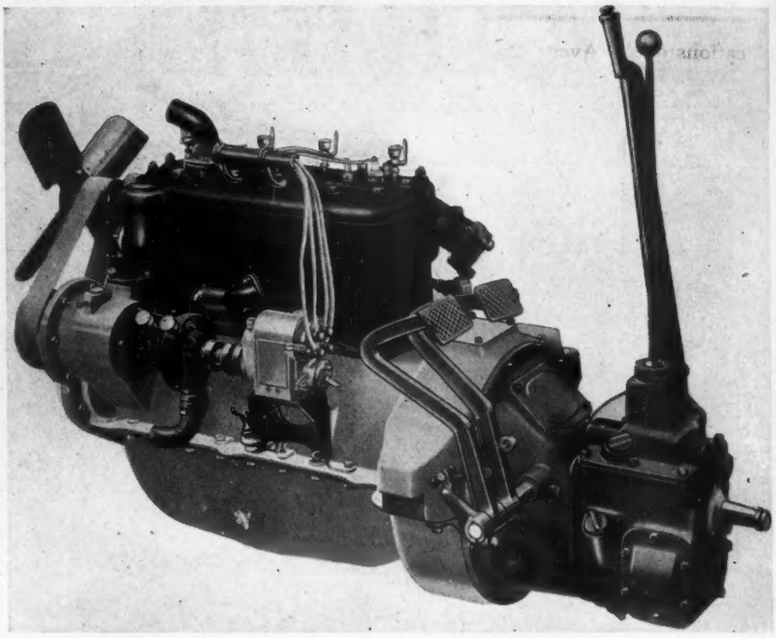
The pressed steel frame of vertical section measuring 5⅝ in. deep with 2-in. flange in front, 3½ in. width tapered to 2¼ in. in the rear is mounted on four vanadium steel, semi-elliptic springs, 2¼ x 40 in. with 9 leaves in the front and 3 x 54 in. with 11 leaves in the rear. The Hotchkiss type of drive is employed.

Heavy artillery type wood wheels regularly equipped with solid tires 36 x 3½ in. front and 36 x 5 in. rear, are used.

The wheelbase is 144 in., tread 56 in. and loading space 122 in. measured from the driver's seat to the end of the frame. The weight of this chassis with solid tire equipment is 3950 lb. complete with body 5050 lb. This job is painted and varnished in the standard Rumely red, green and black.

The standard equipment includes seat, seat cushion, front fenders supported by heavy brackets, jack, set of tools, tool box, hand signal, gas lamps, and gas tank.

Extra equipment includes cab, windshield, body, side extensions, pneumatic equipment, which also includes special wheels, demountable rims, truck type heavy duty tires 36 x 6 front, 38 x 7 rear, and tire pump mounted on transmission case.



This Unit-Power-Plant Consists of a Heavy-Duty Engine, Three-Speed Transmission and Dry-Disk Clutch

Avery Six-Cylinder Truck for Farm Service

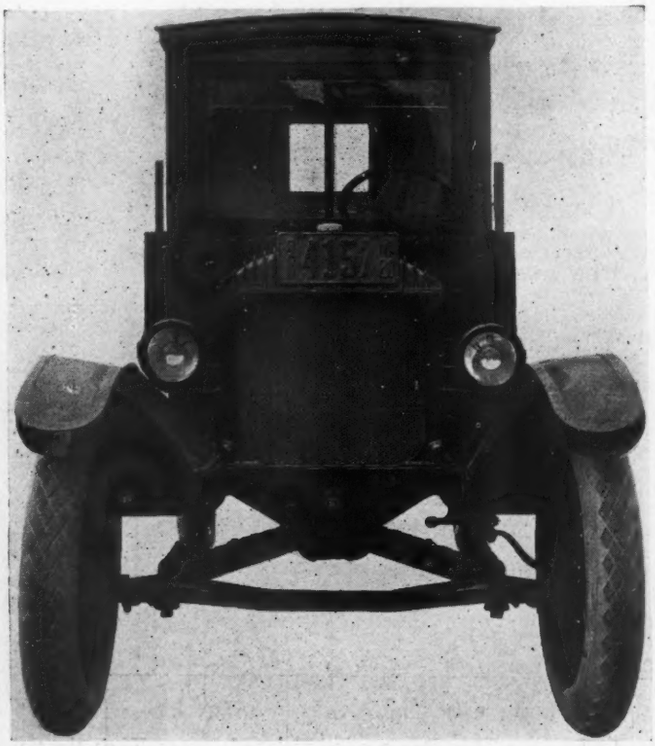
THE new Avery motor truck, designed especially for farm work, now being made by the Avery Co., Peoria, Ill., a well-known power farming machinery company, is especially interesting. These trucks are soon to be in quantity production at the Bartholomew plant, Peoria Heights, Ill. The design of this new truck is said to be such as to make it entirely suited to all kinds of hauling requirements, meeting the varied requirements of farm service in a very satisfactory manner. Among the highlight features of this one-ton truck are the following: Six-cylinder engine, electric starting and lighting; pneumatic cord tires as standard equipment and transverse front springs.

The engine is a six-cylinder Avery. This is a vertical, L-head type, with a bore and stroke 3 in. and 4 in., respectively. The connecting rods are extra-heavy drop forgings. The 1¾-in. crankshaft is mounted in three die-cast bearings. The entire six cylinders are cast in block and the cylinder head is removable, affording access to the pistons and valves.

Engine speed is regulated by a governor of the throttling type. This is inclosed and runs in an oil spray. It is mounted on the magneto drive shaft and driven by the magneto timing gears.

Engine lubrications is by the circulating splash system, with a force-feed pump. Interior moving parts are lubricated by splash.

Ignition is provided by a K-W high-tension magneto with an impulse starter, and fuel carburetion is accomplished in a Stromberg Model I carburetor. The carburetor has a hot-air stove, provided to facilitate easy starting in cold weather. A carburetor choke is on the dash, within convenient reach of the driver. The gasoline tank, located under the driver's seat, has a capacity for 15 gal. Fuel is fed to the carburetor through a Stewart vacuum fuel tank placed beneath the hood of the engine.



Head-on View of the New Avery, Six-Cylinder, One-Ton Truck

Cooling water is carried through a cellular radiator by the thermo-syphon system. The radiator is mounted on springs to cushion it against sudden jars. Cooling is aided by a 15½-in. fan.

Engine power is carried back to the speed-change gears through a multiple-disk dry-plate clutch, of the company's own design. This clutch has steel disks contacting with Raybestos. It is simple in construction and very easy to control.

The selective sliding gear type transmission, which is of Avery manufacture, provides three speeds forward and one reverse. The speeds in miles per hour are as follows: High, 25 m.ph..; intermediate, 12 m.p.h.; low, 6 m.p.h.; and reverse, 4½ m.p.h. High speed is direct from engine. The transmission gear box is mounted in unit with engine and has provision for attaching an air compressor through power take-off hole.

Specifications of the Avery One-Ton Truck

Engine	Own
Speed, normal r.p.m.	1400
Piston rings, number per cylinder	3
Piston rings, groove width	3/16 in.
Valve arrangement	L-Head
Cooling system	Thermo-Syphon
Radiator, make	Own
Radiator, type	Cellular
Lubrication	Force Feed—Splash
Carburetor, make	Stromberg
Carburetor, size	7/8 in.
Fuel feed	Gravity
Ignition system, make	K. W.
Ignition system, type	Magneto
Engine self-starter, make	Westinghouse
Electric lighting equipment	Regular
Clutch, type	Multiple-disk dry-plate
Transmission, make	Own
Transmission, type	S
Locating transmission	Unit power plant
Universal joints, make	Own
Final drive	Internal gear
Rear axle, make	Torbensen
Make of wheel	Own
Speeds forward	3
Speed in r.p.m., maximum governed or recommended	1400
Wheelbase	129 in.
Springs, make	Mather
Size front pneumatic tires	34 x 5
Size rear pneumatic tires	34 x 5
Steering-gear, make	Ross
Brakes on transmission or rear wheels	Rear Wheels
Governor, make, type	Own, Centrifugal
Rims demountable or detachable—	Demountable
Make of rim equipment	Own
Provision for carrying extra pneumatic, where?	Side
Type farm body	Convertible

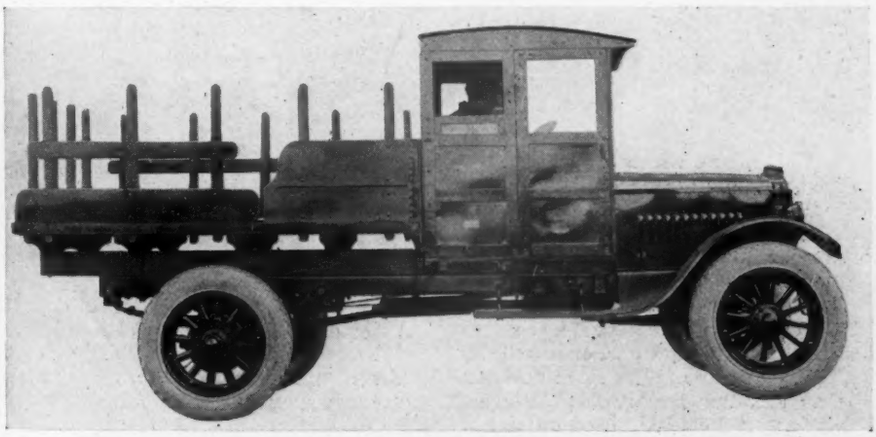
View of the New Avery Farm Truck Hauling a Load of Bagged Grain in the Special Farm Body. Note the All-Weather Cab Inclosing and Protecting the Driver

The driving torque is taken by the rear springs, which embody the Hotchkiss principle. Artillery type wood wheels are used. They run on roller bearings provided at both the front and rear axles and have demountable rims.

have a carrying capacity in excess of the capacity of the truck. The front axle is the inverted Lemoine type, being drop-forged I-beam steel section, heat-treated. The rear axle is a Torbensen internal-gear type, which consists of two units, one for carrying the load and one for driving. Final drive is through spur gears on the jackshaft of the rear axle engaging with an internal ring gear on each rear wheel.

Electric equipment consists of a Westinghouse two-unit self-starter, a generator, a Willard storage battery, Klaxon horn operated by button on the steering wheel, double-bulb head lamps, a tail lamp with license bracket, and a dash light.

One of the features of chassis lubrication is the adoption of the Alemite system. Wherever chassis lubrication is needed grease is forced to the parts needing it under high pressure through a grease compressor and hose, insuring distribution of grease to all moving parts.



Avery Motor Truck Designed Especially for Farm Service

This new farm truck has a unit power plant, pneumatic tires as standard equipment, electric starting and lighting system, 6-cylinder engine and is featured by transverse front springs

Tires are Goodyear cord pneumatic, 34 x 5 in. They have a tread of all-weather design. One spare rim comes with each truck.

The wheelbase is 129 in. and the tread 56 in. The frame is 5-in. pressed-steel channel section, reinforced with three cross members. There is a bumper at the front. Sheet steel fenders at front and rear are provided. They are secured to steel brackets.

Springs are vanadium steel, of Mather make. At the front these are the single transverse type; at the rear they are the semi-elliptic type.

The front and rear axles are especially designed to withstand farm service. They

There are two sets of brakes. The service brake, foot operated from the driver's platform, is external contracting on drums on the rear wheels. The emergency brake is operated by hand lever and is internal expanding on the drums of the rear wheels.

Bearing equipment includes tapered roller type for the wheels and ball throughout the transmission.

Left-hand drive, with gear-shift and brake levers in the center of the platform to the right of the driver, is standard. The spark and throttle controls are on the dashboard. This position for the spark and throttle is a departure from conventional motor truck practice.

Commerce Post-War Model Listed at Pre-War Standard

The Commerce Motor Car Co., Detroit, Mich., has announced an addition to its line of light motor trucks, which will have a chassis list price of $1350 and correspondingly low prices on three types of bodies, open express, platform with convertible stake or open express with canopy top. This new 1921 Model, which has a pay load capacity of from 1500 to 2500 lb., will have a maximum speed of 40 m.p.h., and will be equipped with electric starter, electric lights, magneto, etc.

The power, which is furnished by a 3¾ x 5 in. Continental engine, is transmitted to a bevel-gear truck-type Salisbury rear-axle through a Spicer tubular-propeller-shaft equipped with two Spicer universal joints. The transmission, which is in unit with the engine, is manufactured by the Detroit Gear Co. The cone clutch is 14 in. in diam. Brakes 16 in. in diam. Goodyear non-skid Pneumatic Cord Tires, 34 x 4½, are mounted, both front and rear, on wooden artillery wheels. Detroit Steel Products Co. springs are used. They consist of 8 leaves in front, 10 leaves in the rear. The following is an abridged list of other units: Steering gear, Jacox; carburetor, Zenith with Stewart vacuum feed; 15 gal. gasoline tank under front seat; and cooling system, Thermo-Syphon with cast tank Commerce radiator.

Design of New Packard Line of Trucks Governed by Pneumatic Requirements

THE economy of pneumatic tire equipment, a factor that has prominently figured in improving motor transportation at costs lower than are possible with solid tired trucks, is fast being recognized by motor truck manufacturers today. Coupled with this realization, experience has taught that trucks originally designed for solid tires are not qualified for the most efficient service on pneumatics.

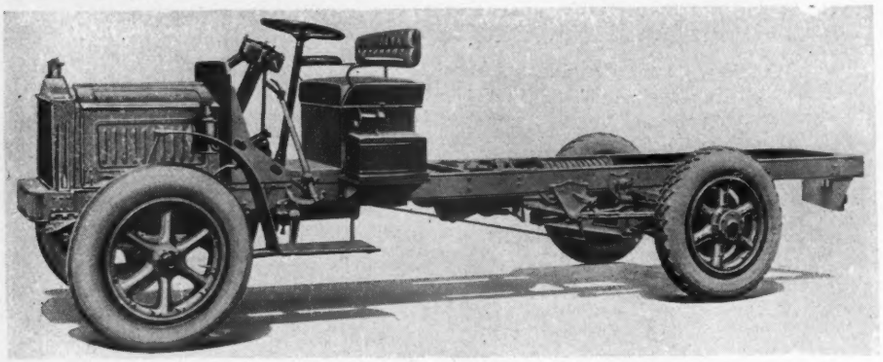
The Packard Motor Car Co., Detroit, Mich., appreciating the requirements in design and equipment of trucks on pneumatics, has constructed a line especially adapted to permit the taking advantage of the benefits afforded by pneumatic tire equipment. Two sizes, namely the VX, a 2-ton truck, and Y, a 3-ton truck, comprise this new line. Both these sizes are included under the new model letter E. In the development of these new trucks the following features were given thorough consideration by Packard engineers.

Tire sizes have been carefully selected to provide ample carrying capacity for the maximum loads recommended for the different models. The rim equipment is demountable, which facilitates the handling of heavy giant size tires in making tire changes or repairs.

To still further facilitate tire handling, metal wheels of the spoke type have been decided upon. A slot in the rim for the valve stem is a provision which makes it unnecessary to lift a heavy tire up over the rim a sufficient distance to allow the valve stem to be inserted in a hole in the rim, which is at present the universal method. The tire and rim simply are rolled up to the wheel and slid over the felloe and shoved home without much physical effort, the valve stem registering with the slot.

A power-driven pump having sufficient capacity to inflate the tires to their recommended pressures is provided as standard equipment. This tire pump, which is supported on a cast iron bracket attached to the inside of the left frame member, immediately in back of the transmission, is driven by an auxiliary counter shaft equipped with a flexible universal joint. More specific details relative to this pump, can be obtained in the June issue of the Commercial Car Journal, page 42.

Another important point which was worked out by the Packard engineers was rear axle gear ratios. These were determined to give high and low gear ability equal to that of the solid tired models. Size VX, standard with 28 m.p.h. axle gears, has a high gear ratio of 7.25: 1, which represents the number of times the engine turns over while the rear wheels are making one revolution. Size Y, standard with 24 m.p.h. axle gears, has a high gear ratio 9:1.



Chassis of the Packard Truck Designed Especially for Pneumatic Tires

Engines of greater power than ordinarily used in trucks of similar capacity with solid tires are used in the new Packards. In the 2-ton truck the engine has a bore and stroke of 4 3-16 and 5½ in., respectively, while the 3-ton size has a 5 x 5½-in. engine which is the same size engine as used in the Packard 5-ton truck equipped with solid tires. These engine sizes were determined upon as proper to provide for the necessary ability of the truck under all conditions without resorting to excessive engine speeds.

The capacity of the cooling system has been made in proportion to the increased engine size. The same size radiator as used on the size FG Packard, which has solid tires, is used on size Y.

The following specifications of the VX 2-ton size is representative of new line:

Engine: Bore	4 3-16
Stroke	5½
Crankshaft bearing diameter	2⅛
Total length crankshaft bearings	11 7-16
Connecting rod bearings diameter	2⅛
Camshaft bearings diameter	2 1-16
Camshaft rear bearing diameter	1½
Piston pin bearings diameter	1⅛
Frame: Depth of channel	6
Width of flange	1 59-64
Fuel: Capacity in gallons	16½
Water: Capacity in gallons	6¾
Oil: Capacity in gallons	2
Springs: Width	2½
Length, front	41
Length, rear	46
Wheels: Number of spokes	6
Tread: Center to center front wheels	58½
Center to center rear wheels	56½
Wheelbase: Short	129
Standard	144
Long	168

	Gear Ratio	Speed in M.P.H.
High	7.25	28
Third	10.76	18.9
Second	18.65	11
Low	33.35	6.10
Reverse	43.7	4.6

Note—The above ratios and speeds are with standard 28 m.p.h. axle gears.

With the standard wheelbase the following chassis dimensions obtain:

Lengths:	Back of Driver	Overall
Standard	121 in.	220 in.
Minimum	109 in.	173 in.
Maximum	150 in.	238 in.
Widths:		
Chassis		74⅜ in.
Frame		31¾ in.
Heights, not loaded:		
Front		69 in.
Rear		36 in.

The estimated weight for the VX chassis, including tools, full supply of gasoline, oil and water is 5200 lb.; the weight on the front wheels is 2780 lb. and on the rear wheels 2420 lb. If equipped with the Vijur Electric Starting & Lighting system an additional weight of 150 lb. should be added to the weights given.

These trucks have been equipped with units of sufficient strength to drive the trucks at speeds of from 24 to 30 m.p.h. effectively according to the maker.

New Packard Pneumatic-Equipped Truck Complete With Body and Cab

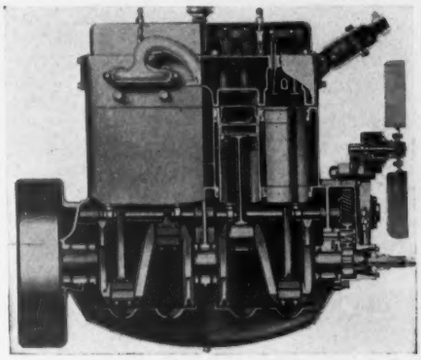
Two Models in Twin City Line of Motor Trucks

BOTH models of the Twin City line of trucks, manufactured by the Minneapolis Steel & Machinery Co., Minneapolis, Minn., which are of two and three and one-half-ton capacities, are designed, constructed and equipped to meet the varied services of truckportation most effectively, irrespective of the jobs they may be called upon to accomplish, whether along industrial lines on the farm or in the service of the contractor and road builder.

The Twin-City 3½-ton model is especially suited for heavy haulage, such as contractor work, road building, etc. So that it may be utilized to the best advantage in such work, steel dump body equipment with hydraulic hoist can be obtained on special orders. The Twin City 2-ton truck, which is designed for lighter loads, is essentially similar to the 3½-ton model, in fact, it is modeled after it. Because of this similarity the following description will be devoted exclusively to 3½-ton model as a fair conception of the lighter model can be obtained from it. The differences lie chiefly in the relative proportions of the various units. If, however, more specific information is desired this information can be obtained by consulting the specification columns of any current issue of the Commercial Car Journal.

One of the main differences between these models is the torque taking principle of construction. The radius rod construction has been adopted on the 3½-ton model, as this form is considered more practical when dealing with heavy loads. It is the opinion of the company that the springs should be permitted to function as load carriers exclusively and to throw the propulsion effort onto the radius rods. On the lighter ton model the company is convinced that the Hotchkiss principle of mounting the rear axle with the frame is the most practical construction, as it permits higher speed of travel and as the springs are of liberal, sizes they are more capable of taking the torque and torsion in addition to the load. This construction is also said to act as a cushion to meet the stresses between the rear axle and the frame, incident to acceleration and higher speeds.

The engine, which is of Twin City make, is a 16-valve, valve-in-the-head type, with a bore and stroke of 4¼ and 6 in., respectively. The entire engine block is cast in one piece. The removable cylinder walls is another important feature, not only from the point of convenience by making replacements quick and easy, but, the company claims, also from the angle of engine efficiency. The engine has an S. A. E. rating of 29 hp. and is also claimed to develop 36 brake hp. The counter-balanced crankshaft is an integral drop-forging, mounted on



View of the Twin City Sixteen-Valve Engine

Note the removable cylinder walls. This feature facilitates replacements and makes for better efficiency

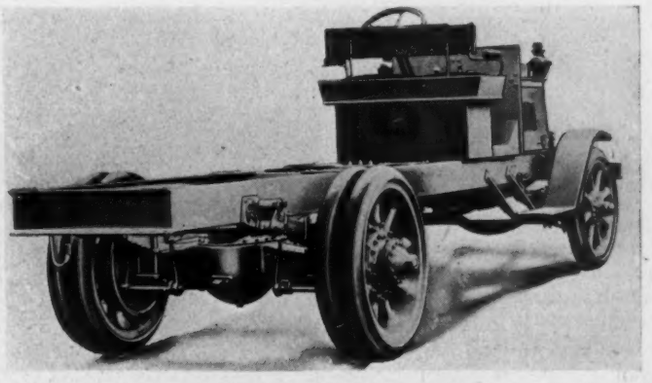
three main bearings of generous size. The main and connecting rod bearings are removable bronze and babbitt linings, and the camshaft bearings are removable bronze bushings. In the designing of this engine careful consideration was given to the question of accessibility by the removable cylinder head, which gives immediate access to the valves and combustion chamber, hand-hole plates to permit ready inspection and taking up of bearings and removable pressed-steel base pan that exposes the crankshaft. The speed of this engine is controlled by a centrifugal fly-ball governor of own design, which holds the engine speed to 1000 r.p.m.

Full force-feed system of lubrication, incorporating a geared pump, is employed. All the moving parts are thoroughly lubricated by this pressure feed oiling through drilled crankshaft.

The carburetor is a Model A 1¼-in. Wheeler-Schebler. A hot spot manifold is incorporated in the engine and is so constructed that an even distribution of heat is said to be given to the mixture for each cylinder. This is also said to insure more perfect combustion with the present day heavier fuels, even at idling speeds. Ignition is provided by an American-Bosch high tension magneto with impulse coupling, which furnishes a hot spark that permits easy starting in all weather conditions.

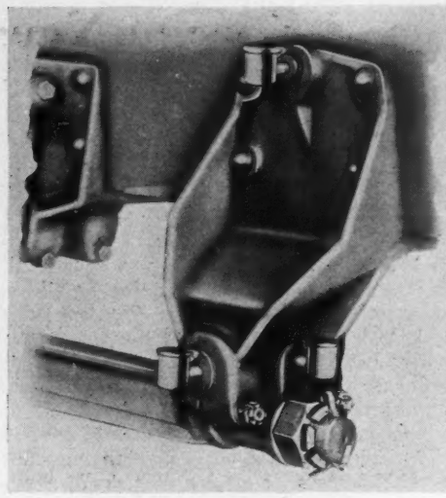
The cooling system includes a centrifugal water pump, 20-in. steel-fan driven by a 2-in. belt and a radiator of the cast-tank five-unit type constituting the Spirex core. The two side frames of this radiator are provided with spring sockets for spring mounting the radiator on the chassis frame.

Power is transmitted from the engine through a single-plate dry-disk Borg & Beck clutch to a Fuller model G-5 selective-sliding-gear type transmission mounted amidships, and which provides four speeds forward and one reverse, the fourth speed being taken direct from the engine. The transmission being mounted amidships necessitates a two-piece propeller shaft which is of high-carbon, cold-drawn steel, tubular section. The 1¾-in. diam. foreshaft is equipped with three disk Flexite couplings, and the 2¼-in. diam. rear-shaft is equipped with Spicer universal joints, fully enclosed against foreign matter, having a final gear ratio of 10 1-3:1. Final drive is through a Timken-Detroit full-floating, worm-drive rear-axle. This axle is equipped with 16-in. diam. Duplex internal expanding brakes, which operate on flange drums. The service and emergency brakes are interchangeable and easily adjusted. The gear shift and hand brake levers are in the center of the dash board. Gas consumption is controlled by an accelerator pedal.

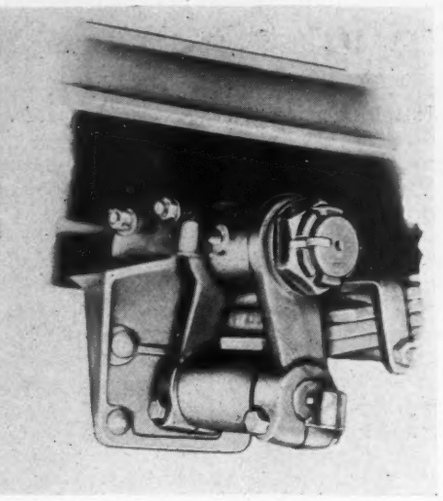


These Three and a Half Ton Twin City Models Incorporate the Radius Rod Construction

Note the general construction throughout; the designing, which covers disposition of units and even lines; and its rugged assembly



Observe the Universal Effect of the Fore End of the Radius Rod



Rear Spring Shackle and Bracket Assembly of the Lighter Ton Model

The drop-forged, heat-treated front axle, which is also of Timken-Detroit make, is of the conventional "I"-beam construction, forked at each end to carry the steering knuckles, which are forged from chrome nickle steel. The steering knuckles are provided with Timken roller bearings, which, being tapered, are easily adjusted.

A Ross fore and aft screw and nut type steering gear, B-M type, which is equipment usually furnished for 5-ton trucks, is used and mounted on the left side. It has a 22-in. steering wheel with gas and spark controls mounted on column.

The cold rolled channel steel frame, which is 36 in. wide, is suspended on four semi-elliptic chrome vanadium steel springs measuring 45 x 3 in., front and 54 x 3½ in. rear.

The Smith malleable iron wheels, adopted for this model, are equipped with solid tires measuring 36 x 5 in. front and 40 x 5 in. dual-solid or 40 x 10 in. single-solid rear.

The wheelbase is 168 in., tread, 66¼ in. front and 65⅛ in. rear, and the chassis weight is 6800 lb.

The standard equipment includes two oil side lamps, oil tail lamp, warning signal, speedometer, bumper, jack and set of tools. Provision is also made for the mounting of an electric lighting system, or a lighting and starting system as extra equipment. When desired an all-weather cab of neat design is furnished. This cab is equipped with two doors, drop side windows, sliding rear windows and windshield.

Two-Speed Jackshaft Incorporated in New Heavy-Duty Sterling Truck

ANNOUNCEMENT has been made by the Sterling Motor Truck Co., Milwaukee, Wis., of a new 7½-ton chain drive truck, christened by the company "The Inter-City Freighter." The outstanding feature of the new truck is the arrangement of a two-speed jackshaft in connection with the standard three-speed transmission, which gives the truck six speeds forward and two reverse. From barely moving on the lowest range of the combination, with tremendous power delivered to the rear wheels through the reducing gears, the truck may be jumped to 12½ m.p.h. on the lowest high gear, and to 16 m.p.h. on the highest high gear. This plan has already been tried out on the company's 5-ton "Road Builder" model, and has proved quite successful.

In this new model the transmission housing is integral with the jackshaft housing, and is attached to the chassis by six large bolts. The emergency brake operates on a braking pulley mounted on the intermediate shaft extending from the right side of the transmission housing.

The engine used in this new truck is of Sterling make, with four cylinders cast in pairs. The bore and stroke is 5 and 6¼ in., respectively, and the engine is rated at 52 hp. The crankshaft is of heat-treated chrome-nickel steel, 2½ in. diam. Valves are of Tungsten steel, 2⅛ in. in the clear. A centrifugal ball governor, built integral with the motor, holds the engine to its normal speed of 1000 r.p.m., at which it exerts its greatest power. Ignition is by Eisemann magneto.

The clutch uses "V"-shaped multiple disks, alternate bronze and steel, operating in a bath of oil.

A Rayfield carburetor is used, heated by both hot air and hot water. Gasoline is supplied from tank under the cab-seat, through a vacuum system mounted on dash.

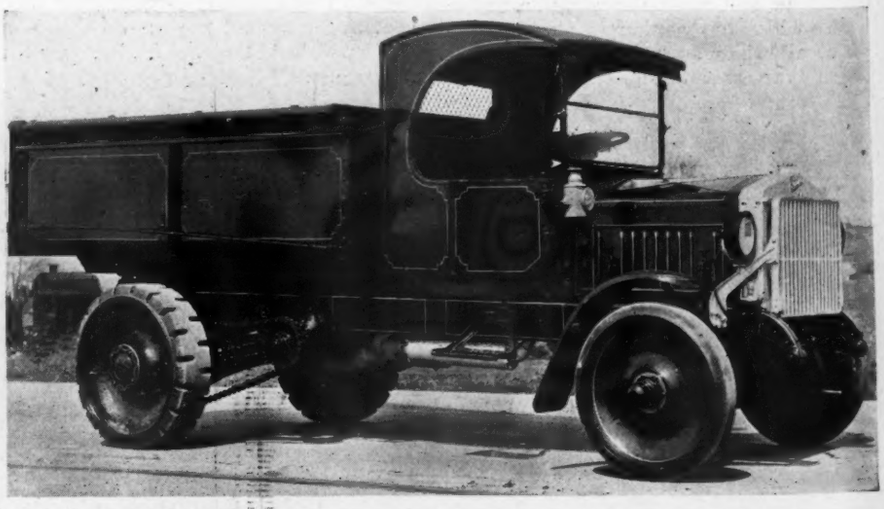
The transmission is of the Sterling make, with gears of 1½ in. face, and shafts of chrome vanadium steel.

The rear-axle is a rectangular nickel steel forging, heat treated. The metal wheels are carried on Timken bearings. Four standard semi-elliptic chrome vanadium, steel springs measuring 48 x 3 x 3 7/16 front and 60 x 4 x 6⅝ rear carry the chassis frame.

The front wheels are equipped with 36 x 6 single solid tires front, and 40 x 7 dual solids, rear. The wheel gage is 71⅜ in. front and 78¼ in. rear. The standard wheelbase for the big truck is 174 in., with an option of 192 in. where extreme length is wanted and 148 in. for tractor and dump-body work.

The frame of this new truck is of pressed steel, channel section 9 in. deep and with flanges 3¼ in. wide where greatest strain comes. The frames are lined with oak sills, as in all Sterling trucks.

Standard equipment for the new truck includes driver's cab with curtains, fore-doors, windshield, electric headlights and taillight, generator, oil side lights, battery, tools, hubodometer, draw bar for trailers, etc.



New Seven and a Half Ton Sterling Chain-Drive Truck

Observe the steel disk wheels equipped with heavy-duty caterpillar tires in the rear and the relative position of body with cab

New Acme Combination Farm Body and Special New Type Steel Dump Body

THE new farm body now being offered to the trade by the Acme Motor Truck Co., Cadillac, Mich., was designed with a thorough knowledge of the various hauling problems that confronts the average farmer throughout the year. The necessity of having a different type of body for each of the multitude of services demanded by a farmer. In order to accomplish this, it was found advisable to construct the body in such a manner as to be easily converted into the type of body most suitable for the matter to be hauled. The versatility of uses afforded by this product is not attained at the sacrifice strength and longevity, in fact, service for a period equal to the life of the truck is claimed by the company.

The base of the body is similar to that of the standard express job, constructed entirely of well-seasoned oak of first and second quality, oiled to prevent the absorption of moisture, and reinforced with malleable iron braces at all points where excessive stresses might occur. Each flareboard is supported with four malleable iron braces and is constructed in such a manner as to form a tight joint with the side of the base. The extension sides are supported with four malleable iron braces securely bolted to each flareboard and arranged so that by reversing the sides they will be held in either a vertical or horizontal position. When in a vertical position they form a box type body of sufficient capacity for the lightest of grain. When in a horizontal position the body is of a hayrack type. Stake pockets are securely bolted to the extension sides for use in supporting a canopy top if necessary.

The ends of the body are securely sealed when carrying grain by end boards, which fit in grooves provided in the extension sides and held in position by long steel rods which extend entirely across the body. The rear end of the body is provided with a drop tail gate. When extension sides are in the horizontal position the end boards are not in use. All extension sides and end boards are made of the best grade oak obtainable and securely ironed to prevent splitting.

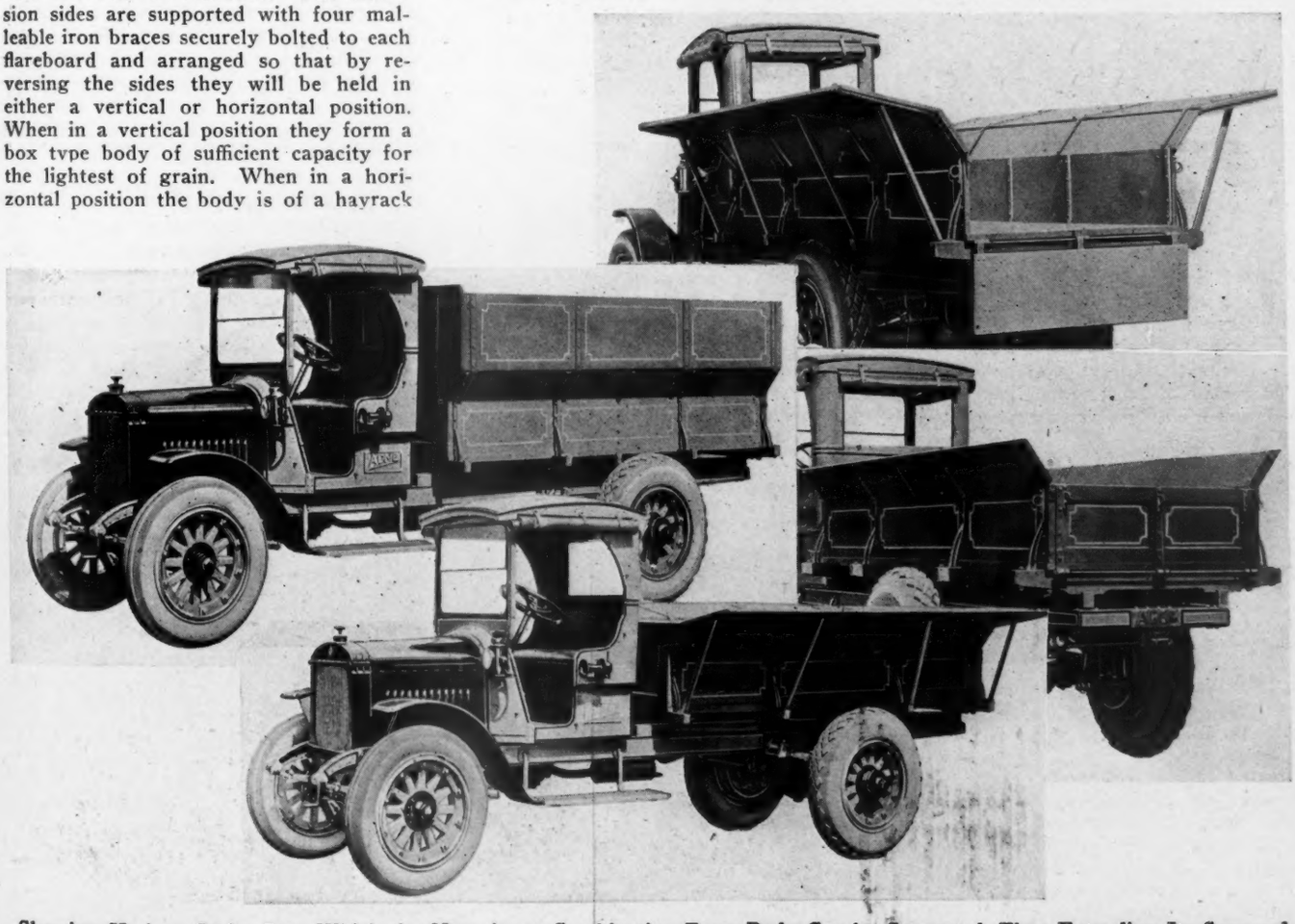
These bodies can be built with capacity suitable for 1, 1½ and 2-ton trucks. The dimensions of body are as follows:

	1-ton	1½-ton	2-ton
Length of base..	108 in.	126 in.	144 in.
Width of base...	48 in.	48 in.	48 in.
Height of base...	14 in.	14 in.	16 in.
Ht. of flareboard.	8 in	8 in.	8 in.
Flareboard width	8 in.	8 in.	8 in.
Ht. of extension sides	16 in.	16 in.	16 in.
Total height	30 in.	30 in.	32 in.
List price	$240	$255	$275

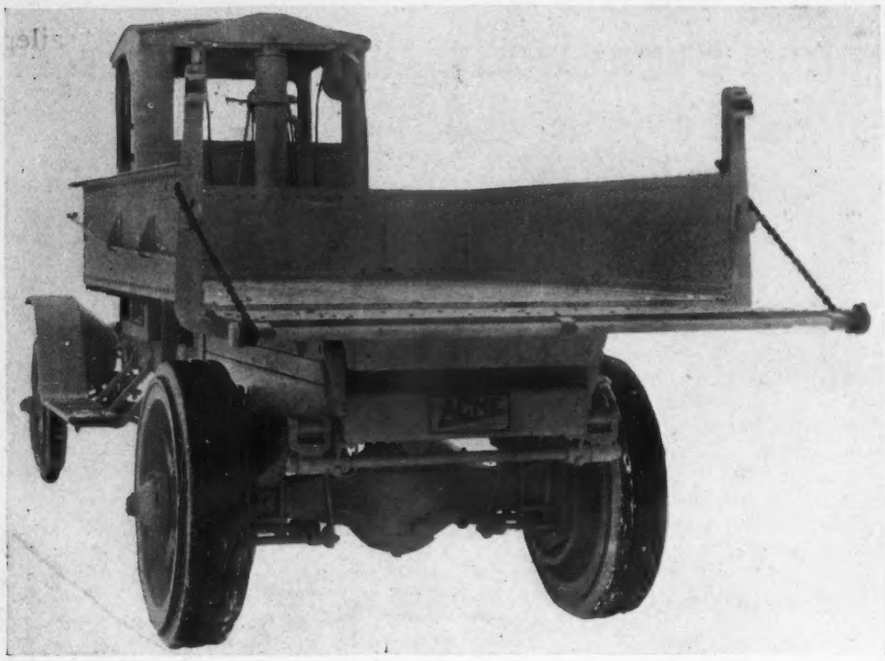
From these dimensions will be noted that the offset of flareboard is not sufficient to throw cattle off their feet when this body is used as cattle rack. The height of the extension sides was determined by allowing sufficient capacity for the lightest grain, such as oats, to make a capacity load for the truck.

A new type of steel body also was developed by the Acme Motor Truck Co., to meet the extreme requirements of dump trucks on excavation jobs loaded with steam shovels. Dumping the load from a steam shovel into a dump body, with the possibility of the body being struck with the shovel, calls for special construction and reinforcement to withstand this severe usage.

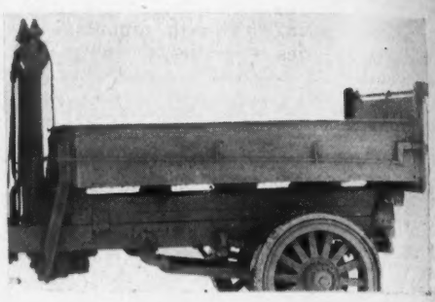
This type of body is designed for use on 3½- and 5-ton Acme trucks. The gravel type of body for the 3½-ton truck is 9 ft. long, mounted on a chassis having a wheelbase of 158 in. instead of the standard wheelbase of 168 in. The 5-ton truck gravel body is 10 ft. long and is mounted on a chassis having a wheelbase of 180 in. This gives an angle of 35 degrees for dumping when a Woods hydraulic hoist is used.



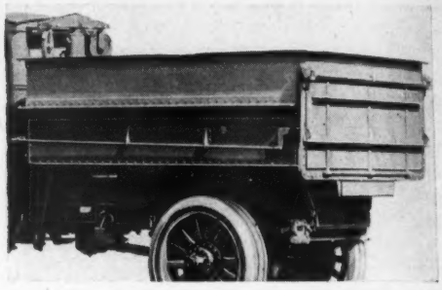
Showing Various Styles Into Which the New Acme Combination Farm Body Can be Converted, Thus Extending Its Scope of Utility Over a Large Farm Service Range



Acme's Special Reinforced Steel Dump Body for Severe Contractor Service



Side View. Note Hydraulic Hoist and Double-Acting Tailgate



Same Body With Added Section

The bottom and sides are made of 8 gage steel plates. The supporting cross members are spaced 26 in. apart, consisting of four angle iron members, 2½ x 3 in. deep, and a rear cross member 4 x 3 in. deep. The corners of the body at the bottom are reinforced by 2 x 2-in. angles and at the top edge by 3 x 2-in. angles; they are also reinforced by a 2 x 2 x ¼-in. angle placed on the outside of the body. The lifting arms are attached to the sub-frame to remove all strain from the body.

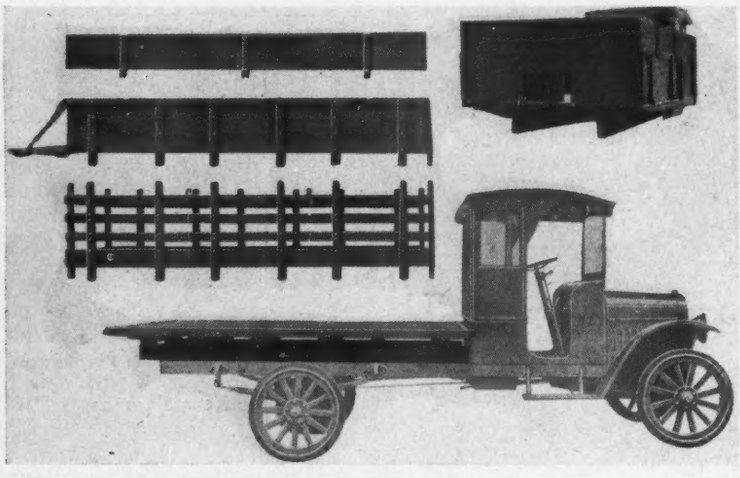
The body is equipped with a double-acting tailgate, 26 in. high, with substantial angle iron reinforcement. The top hinge rod is 1 7-16 in. diam., the bottom rod 1 in. diam. With the tailgate lowered the platform length is extended to 11 and 12 ft. on the 3½- and 5-ton trucks, respectively, making it a practical convertible body. Inside dimensions for this rock, sand and gravel dump body are as follows:

	3½-ton	5-ton
Length	180 in.	120 in.
Width	72 in.	72 in.
Height	18 in.	21½ in.
Capacity, cu. yd.	3 yd.	4 yd.
Capacity, cu. ft.	81 ft.	108 ft.
Pay load weight	7700 lb.	11,000 lb.

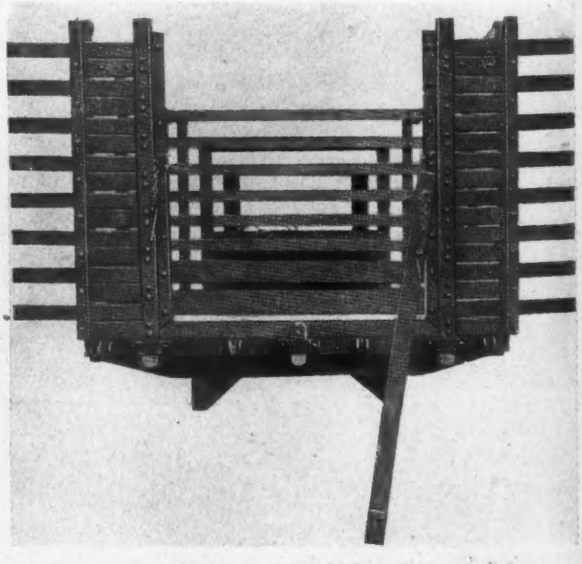
Interchangeable Field Bodies

THE Field Mfg. Co., Owosso, Mich., is manufacturing bodies, known as the Field Durable Bodies, that will fit any make truck. These bodies are equipped with interchangeable units that permit of quick conversion, a feature adapting the body to any manner of hauling. An interchange between any two bodies may be instantly effected upon the same platform. The universal adjustable feature of these bodies is made possible by the adoption of a special subsill attachment by which the main subsill can be adjusted quickly and easily to any desired position, making it correspond to fraction of an inch with any make chassis frame.

These bodies are especially constructed to withstand any amount of usage and are bolted and riveted into one piece making it capable of resisting the most severe



Units of the Field Interchangeable Body



Tailgate of the Live Stock Rack Body Model No. 115

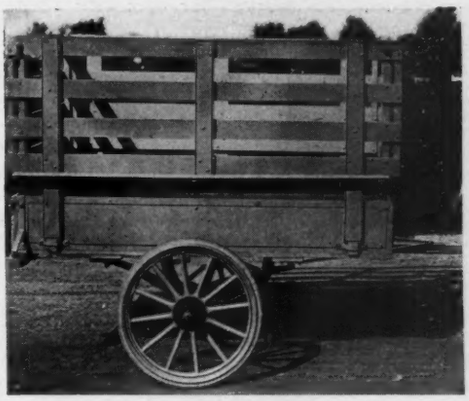
The platform, which is the foundation of the entire series of bodies, ranging from Models 111-119, inclusive, is constructed of matched planking throughout, making it grain tight. Riveted under the angles at each end are scuff-strips. Bolted through the floor into the stake pockets along the top edge are one-piece guard angles. Guard angles are also riveted into stake pockets along the outer edge. The bolster construction is very substantial, and the end of each bolster braces solidly against the stake pockets. Both the subsills and bolsters are of selected hard wood. The proportions are unusually generous, subsills being 5¼ in. x 2¼ in. and bolsters 5½ x 1¾ in.

The following is a brief resume of the construction of the bodies that may be interchanged on the platform. Model 111 is the stake body. The gate stakes are interchangeable, fitting either side, front or rear. They are held in place by two-piece sectional gate fasteners and drop-pins of Field design. Model 112 is the express body. The panels of this style, which are also interchangeable from side to side, are secured in place by draw-bolts. The body is equipped with a drop-end gate and full length chain. The panel grain tank, which is Model No. 114, consists of two side panels, the lower of which is 17 in. and the upper 8 in. high. Any number of additional top panels may be added if desired, all of which are removable and interchangeable and are held together by patented continuous clamp fasteners, supported by an inside grain cleat, a special cushion pad that makes all the joints grain tight. The end gate is a special drop gate with inserted grain gate for easy loading. The stock rack and all-season cab, Model No. 115, permits the loading of any kind or size of live stock without necessitating the removal of the entire end gate. This specially constructed gate, which may be easily opened, is sufficiently wide, being 39 in. in width, for loading cattle and horses. A special feature of this particular job is the fact that the upper slat may be instantly removed if desired, yet not affecting the ready opening and closing of the doors. This model is constructed of hard wood throughout, well bolted and riveted. The corners are locked by two-piece sectional fasteners, which binds the entire rack firmly together without the need of additional fastener rods. Model No. 116, a canopy top express body, may be completely enclosed by heavy waterproof side-curtains or left open as weather conditions warrant. This body is also equipped with an all-season cab. The canopy top supporters are rigidly fastened and braced to withstand any manner of severe service. The Model No. 117, which is a body with an extended canopy top, is specially designed to meet the requirements for moderate climate, and where rainy seasons occur. The feature of this outfit is the fact that the driver has access to the rear of the body without getting out of his seat. It is furnished with heavy waterproof roll-up curtains on the sides and back. Model No. 119, the last of the series, is a body having removable flare boards. It is identical in size and construction with the express model, but is equipped in addition with special 5-in. flare boards heavily ironed and braced, which may be quickly removed. This construction provides the additional space necessary when handling light bulky materials.

Nepessing Stock Rack Trailer

The accompanying illustration shows the Model 21 Stock Rack Trailer, manufactured by the Nepessing Mfg. Corp., Lapeer, Mich. The body is 42 x 72 x 10 in., and is designed with a drop end-gate, 2 in. end sill, heavy full-length hinges, 6-in. flareboards, strongly braced inside and outside.

The springs are oversize six plate semi-elliptic, 1½ x 40 in., special trailer style. The axle is oversize standard tread ball bearing type, 1½ x 56 in. Firestone 2 in. solid rubber tires are used on the 30-in. artillery type wheels. The hitch is direct from trailer to auto frame, and the pole is heavily ironed. The fittings for Ford are furnished regularly.



Model 21 Nepessing Trailer

This model is a Nepessing two-wheel trailer, has 30-in. artillery wheels, 2-in. Firestone solid tires and a ball bearing axle. Springs are semi-elliptic.

Extensive Program Planned for N. T. & M. T. O. A.

To further its comprehensive plans for the stabilization of the hauling industry the National Team & Motor Truck Owners' Association will open up a permanent office with a full-time secretary in Cincinnati similar to those already operating in Detroit and Buffalo. The Cincinnati organization is headed by Pres. George H. Oberklein, of the J. C. Buckles Transfer Co., of that city.

The national organization has an extensive program mapped out which will cover the operation of a truck registration board for interchange work among members, a simplified standard system of costs and methods of removing snow from highways during the coming winter.

Through its locals the N. T. & M. T. O. A. will combat any unfair motor truck legislation which may arise in the various States. Large increases in membership have been reported in both the Buffalo and Chicago branches.

Elaborate arrangements are now being made for the new annual convention to be held in Detroit the latter part of June, 1921.

This Mammoth Low Bed Dray Truck is Flexible Despite Its Massive and Powerful Structure, Its Frame Being Capable of Taking by Weave All Manner of Reasonable Road Obstructions.

It is a 10-ton MacDonald front-drive truck, one of a line of three manufactured by the MacDonald Truck & Tractor Co., San Francisco, Cal. The entire power equipment is located in the front. Complete control and easy steering regardless of the weight of the load is accomplished through a hydraulic steering gear.

Correction

In the description of the Bridgeport line of trucks which appeared in the September issue of the Commercial Car Journal statement was made that T. H. Bartley and W. J. Bartley were connected with this concern. This statement is incorrect as neither of them are connected in any capacity with the Bridgeport Motor Truck Co., Bridgeport, Conn. Also the price of the model C, which was listed at $3650 is incorrect, it is $3850. Opportunity is taken at this time to make mention of the following men on the company's board of directors exclusive of the officers as these names were not included in the description: Carl McCann, Portland, Maine; A. E. Wales, Boston, Mass.; John Hall, Fall River, Mass.; and Harry G. Babcock, New York City.

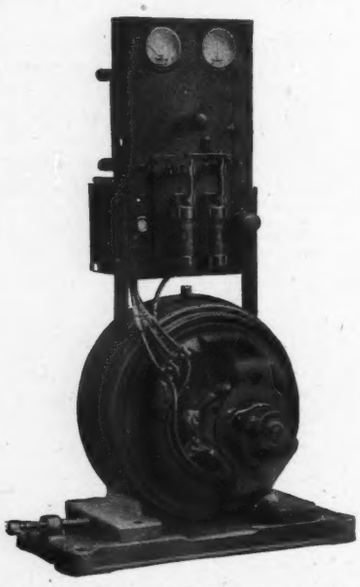
Since 1915 American railroads have increased the total amount of freight traffic handled about 50 per cent.

TRUCK EQUIPMENT AND APPLIANCES

Electric Generators and Panels for Farmers

The Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., is offering to the market a line of electric generators and control panels for use with internal combustion engines for farm light and power service.

These electric generating units are made in standard capacities from ½ to 2 kilowatt and are adapted for operation with 32-volt battery equipment. The generators are built to be directly connected or belt driven. The belt-driven generators are equipped with sliding bases with adjustment to keep the belt at the proper tension. They are shunt wound for normal operation, but have an additional



Westinghouse Electric Generating Outfit
This is a unit, non-automatic in operation for generating current for farm lighting outfits

series winding which allows the generator to be operated as a compound motor with a large starting torque to crank the engine.

The control panel is made of sheet steel and is mounted directly on the generator. On the panel are a voltmeter, ammeter, rheostat, line switch, line fuses, series field (starting) switch, ignition (stopping) switch and a reverse current relay.

The operation is simple. To start the unit, the series (starting) button, at the lower right side of the panel, is pushed in causing the battery to operate the generator as a motor to crank the engine. To stop the unit, the switch at the lower left of the panel is pushed in, breaking the ignition circuit of the engine. The rheostat controls the battery voltage and the double pole fused switch in the center of the panel is used to connect the electric generating unit with light and power line.

The relay mounted on the rear of the panel automatically keeps the battery from discharging through the generator when the generator is not running. It also automatically connects the generator to the battery when the generator voltage is sufficiently high to charge the battery.

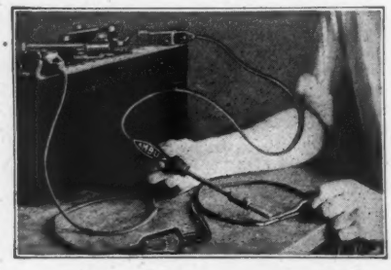
An automatic stop is also supplied with these panels when desired. The stop consists of a clock, mounted on top of the panel, which can be adjusted to cut the engine ignition circuit when the battery has been fully charged. This panel is, therefore, semi-automatic since it is only necessary to manually start the unit—the clock mechanism automatically stopping the unit at the proper time.

Ambu Soldering Iron

The Ambu Soldering Iron, manufactured by the American Bureau of Engineering, Inc., Chicago, Ill., can be employed wherever there is a storage battery, whether in a shop, on a truck, or in a garage. Use of this iron permits the individual owner or driver to personally solder all connections without the usual difficulties incident to electrical troubles, easily, quickly and at any time. The principle of its operation is simple. The carbon tip of the iron, when brought in contact with the piece to be soldered, completes the battery circuit.

Its utility covers a broad scope of repair work, being particularly adaptable for such work as putting a test point handle on a wire, soldering a terminal, splicing a wire, soldering armature leads, etc. The fact that no current is consumed except at the instant of soldering, and that it is impossible to leave current turned on because the flow stops the instant soldering stops, are features that protect the owner or user against the expense of idly flowing current when the instrument is not in use. The current used in starting once is enough to make more than eight connections.

This soldering iron, complete, consists of three feet of rubber-covered braided



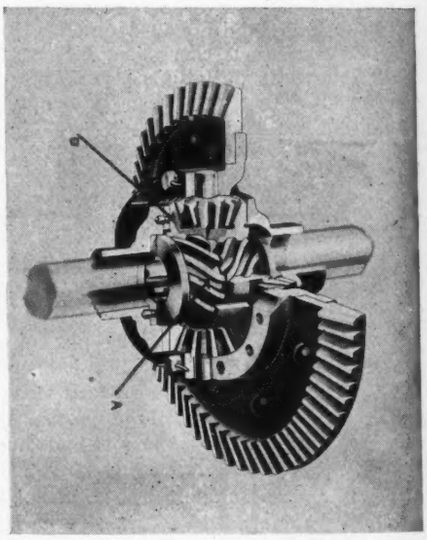
Ambu Solder Iron in Use

wire with a clamp for attaching to battery, a three-foot connecting wire with two clamps, six carbon points, a piece of wire solder and one 2-oz. can of Ambu Soldering Paste. It sells complete at $5.00.

Nogrady Conventional Differential

In general construction the Nogrady differential follows conventional lines. It is manufactured by the Nogrady Differential Co., Detroit, Mich. It is fitted with the customary bevel pinion and gears, the latter being fitted with internal helical spline (a) that engages with an external helical spline (b) which is a portion of a member fitted to or integral with the main axle shaft.

In action, when the traction of either of the rear wheels varies, this helical spline tends automatically to thrust the differential bevel gears or side gears against an abrasive or hardened steel member, thereby setting up a friction load that is transmitted to the differential



Nogrady Differential
Use is made of spiral thrust actuators, combining differential action with automatic locking of the entire rear axle, when only one driving wheel has traction.

housing as a rotary load, and from then on to the main axle shaft. This surface against which the helical spline thrusts the differential bevel gear, is fastened to or integral with the differential housing On a straight course the effect due to the spline is to thrust the side gears outward and against the provision for engagement with the differential housing. In making a turn from a straight course the gears are brought to bear against each other, and the thrust is then balanced and neutralized, thus functioning with ease and accuracy.

Tokheim Visible Dispensing Pump

Stress is laid upon the claim that visible dispensing protects the dealer against over-measuring on the part of too-generous clerks to their favorites, puts an end to collusion between dishonest customers and weak salesmen; and, at the same time, protects honest salesmen against charge of over-measuring or under-measuring, because the actual measure as delivered through the clear glass graduated globe at the top of the pump and totaled by meter, corresponds day by day and week by week with the receipt of gasoline from the source of supply; and with the cash register records.

The Tokheim Oil and Pump Co., Fort Wayne, Ind., has brought out a pump known as the Victory Visible No. 200, that is claimed to ably cope with the above conditions. This pump has been granted the approval of the Underwriters Laboratory, Inc., of Chicago, which is operated by the National Board of Fire Underwriters. The underwriter label service has been extended to this pump. The following descriptive brief which brings out the prominent features, will make plain the advantages of this visible pump.

This pump cannot be operated unless and until the revolving steel doors are locked wide open, which provides a 14-in. opening at both front and back, permitting a customer to see clear through the cylindrical glass tank from either side as it is filling and discharging. The interior is so illustrated and illuminated by an electric bulb that the customer is equally protected by night or day.

The outlet valve to the customer's car cannot be opened while the pump is covering, as opening the discharge valve automatically closes the inlet and shuts off the pump. This provision protects the seller of gasolines from carelessness or mistaken generosity of clerks or from collusion between dishonest employees and bribing customers.

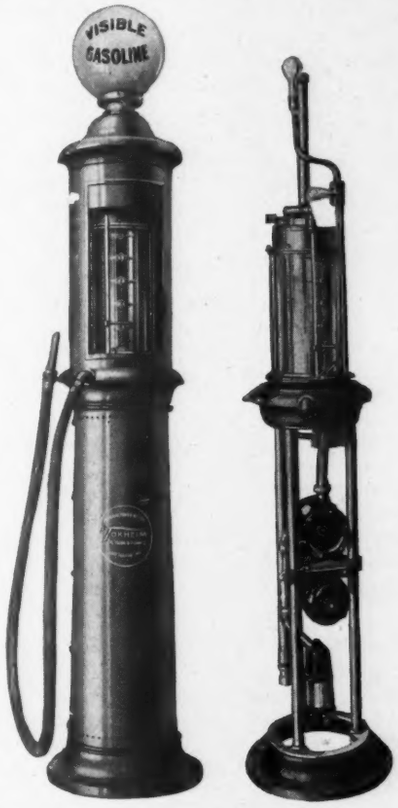
Any gasoline remaining in the measuring bowl at close of day's business is permitted to drain back to the underground storage through an outlet which is opened by closing the revolving doors. The instant this drain valve opens, the meter is automatically disconnected, insuring the owner of the pump that only the gas that actually flows in the customer's car is registered.

Customers are protected from the too common "trick" of stealing part of their gas after it has been metered and charged to him by a provision preventing the drain valve to the underground storage from being opened until the outlet valve to car is closed and revolving doors of pump closed and locked shut.

A complete discharge of all the liquid contained in the hose is insured by a vacuum breaker which is always open. The air inlet of this vent is located above the liquid level inside the glass measuring tank where it cannot be tampered with.

An electric motor fills the clear glass measure in seven seconds, a time saving factor that gives the operator freedom to direct his attentions to suggestions for the sale of accessories, while the gasoline is draining from the measure to the customer's tank.

This method of dispensing, also insures the customer, not only of full measure, which he sees as it stands still in the glass measure, but also that he is getting unadulterated gas, he assures himself of by glancing through the glass measure.



Exterior and Interior Views of the Tokheim Visible Dispensing Pump

An indubitable check is extended the customer against dishonest practice

New Prest-O-Lite Dry-Shipped Battery

The thing of the moment in the storage battery line is a new type of dry-shipped storage battery recently introduced by the Prest-O-Lite Co., New York City. Unlike the older type known as the Prest-O-Lite "Green Seal," this new type is completely assembled, requiring but the addition of electrolyte and adherence to directions on a new instruction card to put the battery in operation.

The advantage of this type of storage battery for the distributor is that it may be kept in stock for twelve months without deterioration, a fact which permits dealers to carry special types of batteries for which there is a comparatively small demand. Dealers who carry Green Seal Prest-O-Lite batteries exclusively may convert them to wet stock as needed, thereby being enabled to offer each car owner a freshly developed battery.

In order to differentiate for the present between the old type and the new, the latter will be called the Assembled Green Seal, the older type being termed the Partly Assembled Green Seal.

New Raybestos Trailer Brake Equalizer

Announcement is made by the Raybestos Co., Bridgeport, Conn., of the Raybestos trailer brake equalizer, a new invention which is claimed to make the operation of trailers as safe and certain as the operation of the truck.

This equipment, which is purely mechanical, is simply but durably constructed, and contains but few parts liable to disorder.

Provision is made for variation in trailer platform heights due to loading, and for charged position of the trailer in relation to the truck in making turns on the road. In fact, that is the whole purpose of the equipment: To make positive the operation of the brakes on the trailer no matter whether it is empty or heavily loaded, on level road or hills, on a straight or a curved course, or around corners.

Every truck operator knows that driving down hill with a loaded trailer is a difficult task unless there are adequate brakes. In many instances it has been found that the trailer will "ride" the truck, sometimes swinging into a ditch, taking the whole rear end of the truck with it.

With the new Raybestos equipment the truck driver is enabled to operate truck and trailer as a unit, because when the brake is applied on the truck, the trailer brake is simultaneously brought into operation. Similarly, a train of trailers, if each is equipped with the brake equalizer and each is connected with the rocker arm of the one preceding it, can be controlled with like facility.

This equalizer consists of a supporting bracket, an equalizing arm on which are mounted two bell crank levers, the usual clevises for connecting with pull rods, and two equalizer rods, one to the trailer and one to the truck. The supporting bracket may be fastened to the rear end of the truck frame or to the front end of the trailer.

If one truck and one trailer are to be used together continuously or nearly so, it would be more advisable to fasten the equalizer to the truck. If different trucks are to work with the trailer the device may be mounted on the front of the trailer and connected by a hook with the pull rod from the truck brake.

In the supporting bracket is a horizontal slot or guide in which a stud in the end of the equalizer bar works back and forth. Sufficient room for play is allowed so that the truck and trailer may pass around any curve and still leave the trailer brake under perfect control of the truck driver.

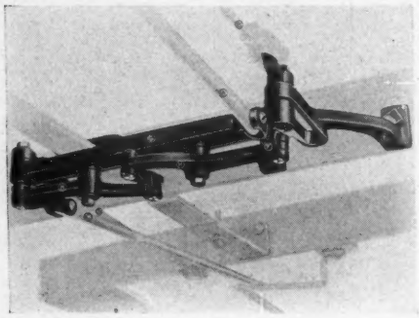
A distance rod holds the stud in the equalizer bar always at the same distance from the trailer. It may change angle but not distance. The other end of the equalizer bar is held by another rod, and here again allowance is made for change of angle, but the distance from the truck remains fixed by the length of the rod.

On top of the equalizer bar are two bell crank levers connected by a clevis. The outer end of one lever connects by clevis with the truck brake pull rod. The outer end of the other lever is connected with the trailer brake pull rod. When the brake

on the truck is operated the pull rod, working through these levers, operates the brake on the trailer.

The advantages claimed for the invention are simplicity, positive action under all road conditions, the fact that it can be applied to existing trucks, trailers and brake mechanisms with few changes, and its negligible cost of attachment.

There are only twenty-five parts, including studs, bolts, clevises, washers and cotter pins. Of these only six are moving parts. Likelihood of breakage or damage is, therefore, slight. Most of the parts, however, are regularly stocked by accessory stores and garages.



Raybestos Trailer Brake Equalizer

A. Pull rod to trailer brake; B. Rod from attachment to axle spring clip; C. Pull rod to truck brake equipment; D. Equalizer rod to truck axle or clip at center of frame or axle; E. Supporting bracket attached to trailer brake frame; F. Universal joint; G. Equalizing bar; H. Bell crank levers; I. Link or double yoke

Patterns and jigs have been completed and the company is prepared for quantity production. It is anticipated that the demand will be considerable.

Sivyer Steel Wheels for Pneumatics

A new design of steel wheel for pneumatic tired trucks has been developed by the Sivyer Steel Casting Co., Milwaukee, Wis. The wheels are of the single disk type. The hubs are cast integral of refined electric furnace steel, heat-treated.

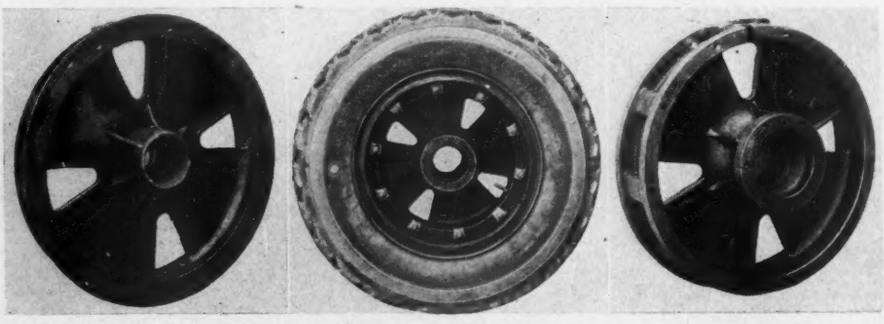
Among the distinctive features are four triangular shaped openings in the web. These triangular openings appreciably reduce the wheel weight and improve the appearance. One of these openings is located over a valve slot, permitting the use of the standard valve stem, so that offset valves or special valves are not necessary. This opening provides sufficient clearance above the valve stem to receive any standard air line connection for inflating the tire.

The valve slot is opened through the outside edge of the wheel, permitting the ready mounting or demounting of demountable rims and tires, eliminating the necessity of lifting the tire to get the valve stem in the slot.

The channel section rim is reinforced by cross braces. This affords a very strong, light construction, and eliminates considerable weight at the periphery of the wheel. The web is centrally located with respect to the rim, for the proper distribution of driving and load stresses. The hub is cast integral with the wheel, making for unit construction, and joins the web in easy curves. The reinforcing ribs give additional rigidity and tend to assist in distributing the driving stresses uniformly.

The disk type of construction makes it possible to obtain the necessary strength in combination with light weight. The 2 and 2½-ton truck wheels, illustrated herewith, weigh 84 lb. and 104 lb. for the front and rear axles, respectively.

Special attention has been paid to eliminate any features of design which would cause strains to be set up during the casting process. The excellent physical properties of electric furnace steel and its well known anti-crystallization properties are additional factors of safety which insure ample strength under all conditons.



Three Views of the Sivyer Electric Steel Pneumatic Tire Truck Wheel

The above are designed for trucks of from two to two and a half tons capacity. The left-hand illustration is an inside view; the center is also an inside view, but with tire attached; and the right is an outside view

Gladiator High-Tension Timer

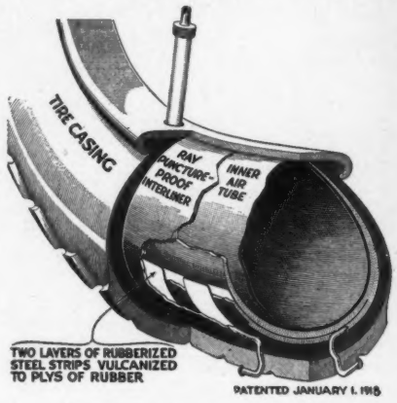
Among the claims made by the Gladiator Co., Auburn, Ind., regarding the Gladiator high-tension timer, are that it gives perfect ignition through its self-cleaning high-tension magneto contact points, which are stated to be impervious to corroding, pitting or burning, thus insuring an ever efficient flowing current at the lowest or highest speeds. It is guaranteed for 50,000 miles.

Steel Strip Reliner

The Ray puncture-proof interliner for all pneumatic tire casings is a product of the Ray Tire & Rubber Co., Chicago, Ill. It consists primarily of flexible metal strips covered with a special rubber compound and is designed to protect the inner or air tube against puncture from sharp objects that might penetrate the casing across zone of road contact.

This puncture-proof interliner is made in one continuous piece or circle, and in all sizes, the same as pneumatic tire casings. Each contains from six to eight plies of cotton fabric and two layers of metal strips with two plies of fabric between the metals, these metal strips are 1 in. wide running across the tread, ½ in. apart and overlap each other.

The rubber compound on the metal strips is pliable but not expansive. Adhesion is secured between this compound and a soft elastic compound that expands and contracts, which in turn adheres to the rubberized fabric of the interliner.


TIRE CASING
RAY PUNCTURE PROOF INTERLINER
INNER AIR TUBE
TWO LAYERS OF RUBBERIZED STEEL STRIPS VULCANIZED TO PLYS OF RUBBER
PATENTED JANUARY 1, 1918

Ray Puncture-Proof Interliner

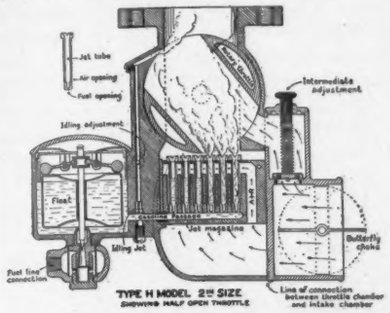
This interliner can be easily and quickly inserted in any pneumatic casing and as it decreases the expansion of the inner tube the strain on the tube is lessened and, therefore, its life increased. It weighs approximately 4 lb. It is about 5-16 in. thick across the tread and tapers along the side to 1-32 in. at the extreme end.

Miller H Type Carburetor

The Miller "H" Type Carburetor produced by the H. A. Miller Mfg. Co., Los Angeles, Cal., is a multiple jet expanding carburetor of the barrel throttle type. Four to six main jet tubes are used depending on the size of the carburetor. These tubes, each of which have the fuel jet in the bottom and four small air holes a little above, are arranged in a row in a removable magazine. This magazine has a fuel passage, which supplies the jets and also provides an air jacket which surrounds the main portion of each tube. These jacket spaces have a passageway near the top of the magazine above the float level that connects them with each other and with the outside air. When not in action the tubes and the surrounding air jacket spaces are filled with fuel, which provide a succession of puddles as the throttle is opened. When the throttle is opened the tubes are brought into action one after the other. Each tube, when the puddle has been drained, begins to function as a miniature carburetor with fuel entering at the jet in the bottom and air being supplied through the four small air holes just above.

By this design, the fuel goes through a two-stage atomization process, the first in the bottom of the tubes where a heavy spray is formed, and the second in the venturi of the carburetor where the spray unites with the main air column. The main feature of this construction is the

fact that the fuel flows through the jets by gravity from the float chamber and combines with the air of the first stage at a point below the float level. This brings



Miller Model H Carburetor

This latest addition to the Miller line, known as the Model H, is a multiple jet expanding carburetor of the barrel throttle type

the partially atomized fuel out of the tube and into the venturi for the second stage without the choke restriction necessary to create a depression at this point.

Two exterior adjustments are provided. The first is for idling and is a control of the idling-speed air by a screw in the passage. The second adjustment is for intermediate speeds and has its principal effect on the first third of the throttle range. It amounts to a control of the spring tension on a poppet valve which admits a certain amount of air during the first part of the throttle opening when vacuum is at a relatively high point. This adjustment has its greatest effect as a control for pick-up, and consequently is also an adjustment for economy. To meet any unusual requirements for a setting, the standard main jets or idling jet may be changed for ones of larger or smaller size at any or all points in the throttle range. The air intake is made in two sections with an adjustable clamping ring at the joint. The second section can be supplied as a vertical elbow which can be set at any angle required for the hot-air tubing. At the intake connection a butterfly valve is provided as a choker or strangler for starting, which is operated by a flexible wire control from the dash.

"Bearcat" Battery

A new entrant in the battery field is the Barco "Bearcat" Battery, which is being produced by the newly organized Barco Battery Co., 82 West Fort St., Detroit, Mich. The plates in this new battery are made by a special process, which is claimed to give an exceptionally high momentary discharge, an unusually efficient recharge, and a tough hard-plate surface, thus making it more durable and serviceable. It is being produced in seven standardized models, and is placed on the market with a guarantee of eighteen months.

Barco Bearcat Battery

Compound Carbon Remover

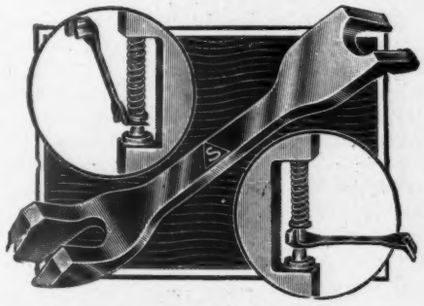
The firm of P. J. Chasler, manufacturing chemists, announces that it has perfected a compound which it guarantees to remove every bit of carbon accumulated in an engine.

In application this carbon remover is passed through the carburetor, like gasoline. It ignites as readily as gasoline, and accelerates the engine. At the same time it rapidly dissolves all carbon depos its, completely driving it out through the exhaust. The entire operation requires but a few minutes. Conclusive tests and experiments demonstrate that this carbon remover eliminates carbon troubles.

Stevens' Valve Lifter

The Stevens & Co., 375 Broadway, New York City, is offering a one-piece valve-lifter that is simple in both application and operation. The two ends perform all that is necessary to remove the pin or assemble the spring.

The wedge end, shown at the left of the accompanying illustration forces up and retains the spring permitting the ready removal of the pin.



Stevens' Valve Lifter

The feature of this lifter is that it is made of one piece of metal and sells for 35c

The tool, when in place for lifting, can remain so while grinding the valve, and for replacing valve and pin. The hammer claw end instantly raises the spring off the push rod guide, then with a quick upward thrust the pin is lifted past the pin hole. Is 6½ in. long and sells at 35c.

St. Louis Rapid-Seating Piston Ring

The St. Louis Rapid-Seating piston ring, put out by the St. Louis Piston Ring Corp., 2638 Locust St., St. Louis, Mo., was developed to fill the requirements for an easy wearing surface. The surface of the ring coming in contact with the cylinder walls is made up of a series of finely tooled grooves, 3-1000-in. deep, which wear in to fit out-of-round, scored or warped spots in a cylinder. These grooves carry a film of oil, which, while wearing-in, lubricates the cylinder wall, thereby preventing any danger of scoring during the wearing-in process.

This ring is made of a one-piece grey iron casting, concentric and double turned.

St. Louis Piston Ring

Note the finely tooled serrations which wear sufficiently to take up imperfect contours in the cylinder

Because of its easy wearing surface, it is alleged that this ring requires no lapping in.

It sells at the following prices for standard sizes: 2⅝ in. diam., in widths 5/32 and 5/16 in., $.50 each; 4½ to 5 in. diam., in widths 3/16 to 5/16 in., $.60 each; all sizes ⅜ in. width, $.75 each. No extra charge for standard oversizes of .005, .010, .015, .020, .025, .3125, and .033 in.

Raybestos Ford Brake End Lining

Two new additions to the Raybestos Company's line are the Rayco ford transmission lining and the Royal external emergency brake also for installation on the Ford.

The former is a woven cotton material specially impregnated to withstand heat and insure smooth action. It is put up in complete sets consisting of three pieces of lining 23½ in. long, 5/32 in. thick and 11/8 in. wide with brass rivets for attaching.

The external emergency brake equipment consists of two Duplex contracting brakes, size 8¼ x 1¼ in. and Raybestos lined, two supporting fixtures, and the necessary pull rods and clips to properly attach.

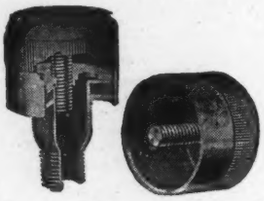
These brakes are easily attached and particularly serviceable in hilly country. They are controlled by the same lever which operated the presently employed internal metal to metal brakes. The attachment consists of disconnecting the present pull rods and attaching the rods supplied with these brakes for which complete instructions are furnished with each set.

Rayco Ford Transmission Lining

This is a woven cotton lining material, especially treated to withstand heat of the Ford transmission

Garrison Grease Cup

The Garrison Co., Inc., Bridgeport, Conn., manufacturing engineers, are announcing new grease cups under the stock name of Garrison that are claimed not only to satisfactorily lubricate bearings while in operation but contain those features such as standard threads, permanent caps, and provisions against grease leakage and for ready refilling, so necessary in an effective cup. Another important feature incorporated in its construction is a provision that prevents the base from expelling grease when removing the cap.



Cutaway Views of the Garrison Grease Cup

Note the simplicity of its assembly; also non-grease-expelling feature

This grease cup consists, primarily, of a cap which is a drawn steel shell having a screw electrically welded in the center of its head and a hexagon base which is also of drawn steel and has a screw plate electrically welded to its flange head. This screw plate, which has four holes evenly spaced around the center and immediately over the base, not only performs the function of preventing the grease from being sucked from the base when removing the cap but also receives the welded screw in the head of the cap, which when turning, compresses the grease, forcing it through the four small openings into the base and through it to the bearing.

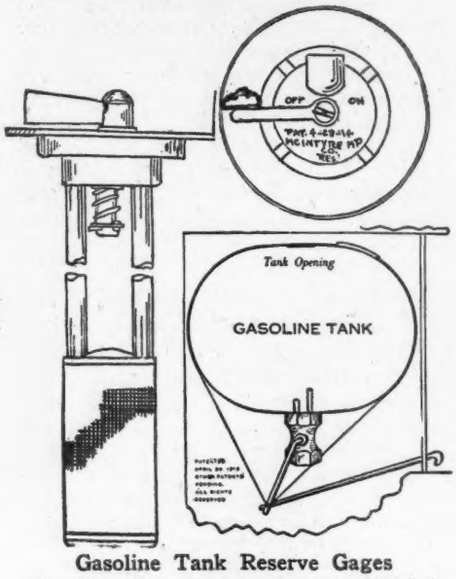
Gasoline Reserve Device

The Hi-Lo valve recently brought out by A. C. Clark & Co., 1035 E. 76th St., Chicago, Ill., is an emergency reserve valve for controlling, conserving and economizing gasoline. It is of the dual valve type and can be fitted to any make of truck or passenger car.

It primarily retains as a reserve any predetermined amount of gasoline, but with the indicator of the device at the "off" position it stops the flow of gasoline to the carburetor, eliminating loss by leakage. Furthermore it can be locked in the "off" position not only preventing theft of fuel but making it equally difficult to steal the machine. Then in addition it contains a special copper cloth screen which positively filters all oil, dirt or sediment from the gasoline.

This valve is manufactured in two styles, first for the vacuum or flat top tank system and secondly for the gravity tank. In the Ford, which comes under the heading of the second type, it is screwed in between the tank and sediment bulb without the necessity of cutting or tapping new holes.

The operation of this valve is extremely simple, that is when the valve indicator reads "off" the moving of a small lever opens the reserve tank and at the same time closes the opening of the main tank which cannot be refilled without the pushing of the lever back to its original position, thus insuring at all times a full reserve tank and positive safety on the road. The Model A sells at $7.50 and the Ford model at $3.



Gasoline Tank Reserve Gages

The left and upper views show the Model A reserve gasoline valve and the one to the right shows the one adaptable to a Ford

Improvements in Whitney Gas Humidifiers

The R. S. Whitney Mfg. Co., 74 Nichols St., Lewiston, Me., announce that improvements have been made in its gas humidifiers. It has developed and perfected a vacuum drop nozzle, which permits rapid and accurate adjustment from the driver's seat. Besides, the dash-sight-feed-gage, which has been such a success and deemed a desirable feature, is no longer marketed separately but now accompanies the humidifier, except in the case of the No. 3 humidifier for motorcycles, which instrument has a gage on the side of the humidifier. A previous description of this device was given on page 74 of the October, 1919, issue.

Viking Lining for Fords

The Vogt Mfg. Co., Rochester, N. Y., is manufacturing a new brake lining for Fords. In this brake lining, known as the Viking, use of double ended filler threads gives 24 double picks or 48 cross strands to the inch. This means that the lining has "body" and the strength necessary to stand up under the strain of constant use.

Viking Brake Lining

This lining, exclusively built for Fords, is especially adapted to meet the conditions of the planetary transmission

Each piece is impregnated to enable the lining to adapt itself to the hot oil of the Ford planetary transmission. It is warranted not to chatter, glaze or become soft and mushy.

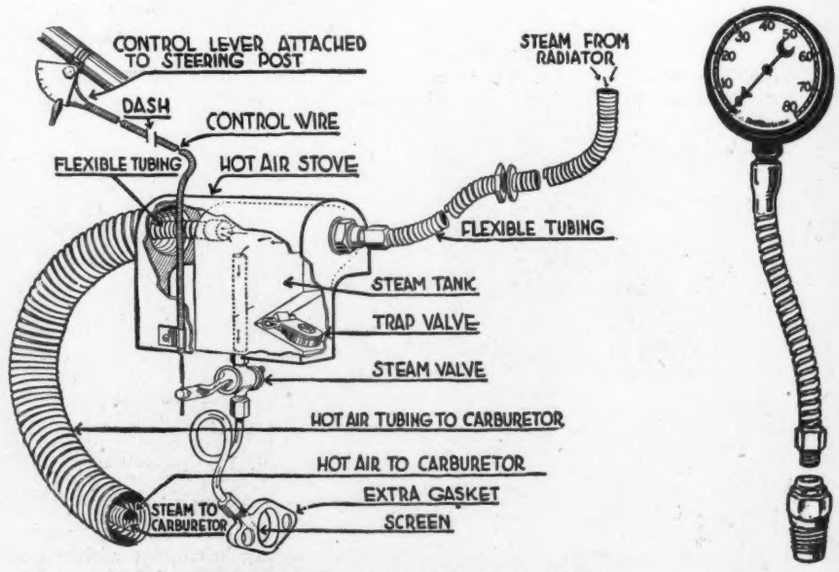
The retail price of $1.50 per set includes 24 best quality split brass rivets.

A New Humidifier and a Compression Tester

The M-R Co., 122 N. 14th St., Lincoln, Neb., recently brought out an automatic hydrogen and oxygen mixer that is claimed to decrease gasoline consumption considerably and reduce carbon formation.

This mixer automatically draws moist air and steam from the top of the radiator through a hot-air intake to the carburetor. Here it is mixed with the air and gasoline and then passes on to the explosion chamber.

From the aluminum tank placed on the exhaust pipe a bronze flexible tubing connects it to the radiator and a brass tubing at the other end passes through the



The New Products of the K-L Line

At the left is the Automatic Hydrogen and Oxygen Mixer, a device which supplies steam from the radiator and hot air from a stove on the exhaust to the intake of the manifold, and at the right is shown the K-L engine compression tester

carburetor hot air hose to the carburetor.

The steam travels through the tank and the tank or stove prevents water from passing directly to the carburetor when the radiator is being filled or when the water is boiling. Excess water in the tank is allowed to escape by means of a trap valve and the remaining water is converted into steam by the heat of the exhaust manifold.

In addition to the automatic part of the system an auxiliary valve is located at the bottom of the steam tank and controlled by a lever and quadrant attached on the steering post. This valve is held by a gasket between the intake manifold and the carburetor and a copper tubing extends up through the steam tank to the top preventing any water being drawn into the intake manifold. The auxiliary is kept closed and operated only when the motor has attained a speed of ten miles or more. This permits the motor to draw moist steam air direct from the radiator through steam tank into the intake manifold, increasing the power without any necessity of advancing the gas throttle and likewise eliminates the motor choking from an over supply of gasoline.

This mixer is manufactured for all makes and is priced according to the size and length of tubing with the exception of the Ford size, which is listed at $22.50.

Another product of the same firm is the K-L Motor Compression Tester. It consists of a special gage fitted with heavy flexible tubing to a union core which will fit all standard plugs. It is a known fact that it requires an even compression in all cylinders to have a smooth running motor and this device shows on the gage the actual amount of compression in each cylinder.

Melotone Compression Whistle

A warning that does not frighten is one of the good qualities of the Melotone Compression Whistle. It is manufactured by the Duplex Machine Co., 93 Lafayette St., Newark, N. J.

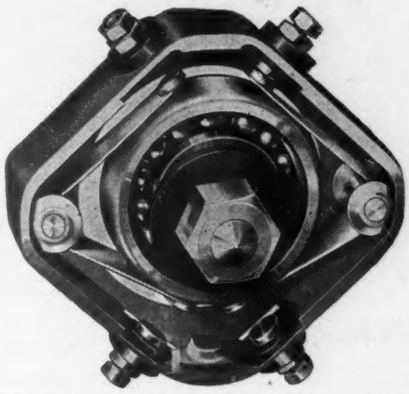
Melotone Compression Whistle
Style No. 2 emits a double note and is especially designed for light trucks

To obtain the proper effect with the various makes of light trucks, it is designed in four different styles, each of which emits a slightly different sound. It is made of brass, and in its construction there is nothing to get out of order. Style No. 3, designed for light trucks, cars and motor boats, produces a pleasing combination of two clear mellow tones. No. 4 is a single-tone whistle, especially designed for the Ford.

An adapter for attaching the Melotone is furnished with each whistle, at an additional cost of 70 cents. These whistles sell at the following prices: No. 1, $6; No. 2, $7; No. 3, $5; No. 4, $5.

Wayne Ball Bearing Timer Bingham Spark Plug

The Wayne Ball Bearing Timer is designed for Ford trucks and cars by the Wayne Engineering Co., Honesdale, Pa.



Showing the Mechanism of the Wayne Ball Bearing Timer

The contact points of this timer are ⅜ in. diam., which is as large as the space allows, to give maximum wearing surface. The fine contact springs are tempered to give the most effective tension. The contact surfaces make and break with a slight wiping action, which tends to keep the contact surfaces clean and avoids pitting. The ball bearings are large enough to stand a load of 480 lb. This timer functions positively, as the contacts are closed definitely by the power of the engine through the medium of the ball bearings.

No oiling or attention is required after installation. The ball bearing is packed with a suitable and lasting lubricant and the contacts through the wiping action are self-cleaning.

The Ionite Non-Liquid Storage Battery

Strength, service and satisfaction are the words which feature this storage battery. The Ionite non-liquid storage battery, manufactured by the Ionite Storage Battery Co., 456 Park Ave., Worcester, Mass., is a battery with non-liquid electrolyte. It is stated not to require filling with water, and is claimed to need attention only once or twice a year for the addition of a small amount of solid electrolyte.

Ionite Storage Battery

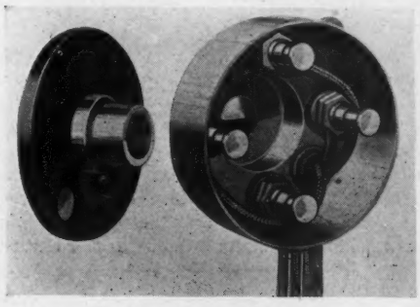
The Ionite battery is constructed with pure sponge lead plates, and its method of manufacture is by formation of a cohesive homogenenous mass of sponge lead which cannot be washed away by chemical action, or injured by abuse. The plate is free from impurities and it is alleged that by this method of purifying the plates and with the consequent increase of porosity, the Ionite shows practically no internal resistance, resulting in about 35 per cent added capacity, higher voltage and longer life.

It is further stated that these plates will stand an abnormal charging rate without excessive heat, without buckling or warping and will maintain a heavy discharge rate with a very slight drop of voltage. This battery is placed on the market with a two-year guarantee.

The Schofield Timer

The feature of this timer is the fact that all electrical connections are inside, no terminals being exposed. This construction removes all possibilities of short circuit through the accumulation of oil and dirt, and prevents the possibility of terminal connections from working loose. It is manufactured by the Schofield Mfg. Co., Cleveland, Ohio.

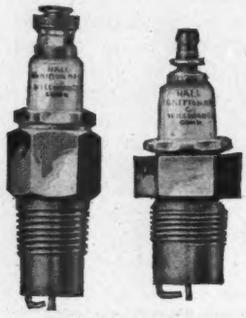
The terminal binding posts are of rigid and substantial construction. They are provided with springs on the inside which keep the terminal in close contact with the rotating member, in fact this timer provides for a quarter-inch of end play in the camshaft and an eighth-inch of side play. The rotating member carries an oversize hardened steel contact which is set into a fibre disc and by this construction the effect of centrifugal force is entirely avoided with wear reduced to a minimum as the contact area wipes across the heads of the posts, with only sufficient pressure to insure a perfect electrical contact. The presence of oil in the timer in no way effects its operation, although provision is made for draining off any excess oil that may accumulate. It is easily and quickly installed. It sells at $4.



Schofield Timer
The contact points are subject to just sufficient pressure to insure a good contact and the rotator disk gives a wiping contact over the hardened steel heads of the post.

Hall Spark Plugs

The Hall line of spark plugs, manufactured by the Hall Ignition Mfg. Co., Williamantic, Conn., are constructed of best grade materials. Chief among the virtues of this line are the following: Super-quality 775 porcelain, insulation of high electrical resistance under extreme



Hall Spark Plugs

At the left is a ⅞-in. S. A. E. extension conical and at the right a ½-in. extension conical. Wire used in these spark plugs is Magno-Spark Point Nickel.

temperatures, which is also less susceptible to injury under sudden changes of temperature, wire of magneto and spark point of nickel.

The Morgancord Fan Belt

The Cloud Accessories Corp., Chicago, Ill., claim that unusual strength and durability are obtained in the Morgancord Fan Belt, due to the vulcanized cord construction, the cords of which run through the entire length of the belt. It is constructed on the principles of a cord tire. Close to the wearing surface there is a series of small vulcanized cords, closely embedded within the belt. Above this layer of small cords are five larger cords, which are also vulcanized.

It is asserted that moisture, grease or dirt cannot penetrate the belt and cause

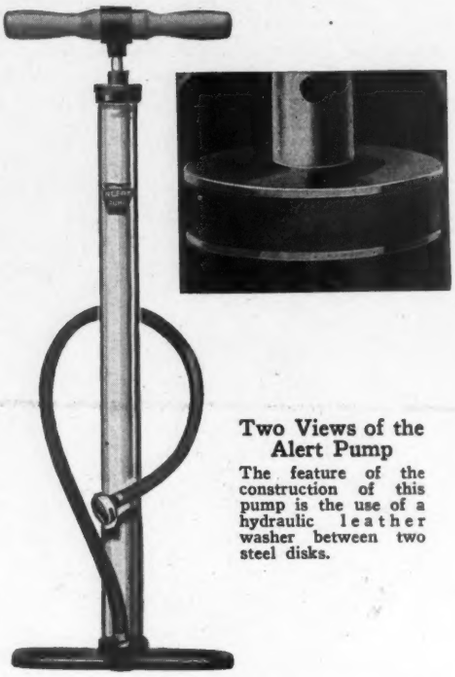
The Vulcanized Corded Construction of This Belt is Clearly Disclosed

deterioration. The seam is in the center of the outer surface, leaving no surface for the absorption of foreign substances. It has a strength of one thousand pounds, and a heat resistance of 300 deg. Fahr.

The Alert Pump

The plunger head of the Alert pump consists of a hydraulic leather washer, between two steel discs held tight against the barrel of the pump by an expansion spring. This design represents a departure from the conventional construction in that the cup washer which is generally employed has been eliminated. The substitution is said to obtain a more air-tight fit against the cylinder wall.

This new construction also permits the piston to be driven clear to the bottom of the pump, thus exacting a maximum amount of compression. The ball check



Two Views of the Alert Pump

The feature of the construction of this pump is the use of a hydraulic leather washer between two steel disks.

valve in the piston permits a free passage of air into the lower chamber, which relieves and makes easier the up-stroke, while the ball check valve in the base eliminates any chance of back pressure. It is manufactured by Arthur G. Norton, Inc., Rochester, N. Y., and marketed by the Alert Sales Corp., 204 Carter Bldg., Rochester, N. Y.

Little Wonder Grease Cup

The Little Wonder Grease Cup, manufactured by the Tioga Mfg. Co., Inc., 3309 N. 12th St., Philadelphia, feeds automatically. The lever at the top acts as a gage and also as a stop device, so that by pulling the lever upward and turning, the cup may be filled. After being filled, the lever is turned, plunger released, and the cup then feeds the lubricant until it is empty, the lubricant being slowly forced to the part to be lubricated as it is used up. It is constructed of brass or soft steel.

Sectional View of the Little Wonder Automatic-Feed Grease Cup.

Globe Battery Box

The Globe Machine & Stamping Co., 1200-1250 West 76th St., Cleveland, O., is the manufacturer of the Globe battery box,, G 108-FBS, which permits a battery to be secured in an accessible place on the running board.

Globe Battery Box

With this box the battery of a Ford delivery car can be secured to the running-board

It protects the battery against mud, water, snow and sleet. Two suit-case catches are used to hold down the lid. This box is finished in black enamel; dimensions inside are 9⅞ in. long, 7⅞ in. wide, 10⅝ in. high. The list price is $3 each.

Piston Inserter

The Cloud Accessories Corp., Chicago, Ill., states that by employing its Piston Inserter a piston of any size with any number of rings can be quickly replaced. This device is so attached that the piston is given a ¼ in. lead into the cylinder,

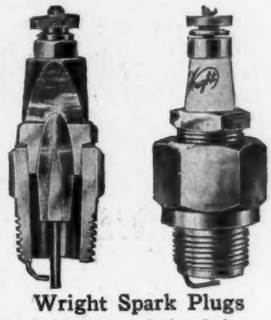
The Cloud Piston Ring Inserter is Adjustable to Any Size Piston

so as to give it a proper seat before it is pressed down. The device consists of sheet steel, which surrounds the cylindrical face of the piston and is adjusted and secured at the proper diameter by two spring clamps equipped with wing nuts.

When used inside the crankcase, the appliance can be opened at one side, permitting it to be clipped over the connecting rod. It is made of flexible twenty-two gage cold rolled steel and is nickel-plated to prevent rusting, and sells at $2.

Wright Spark Plug

The chief feature of the Wright spark plug made by the New York Mica & Mfg. Co., Auburn, New York, is the inside tapered insulation, which is constructed of a high grade of India Mica. This mica is tightly formed into a tapered tube and pressed into the bushing.



Wright Spark Plugs

Note the inside tapered insulation, which is constructed of India Mica

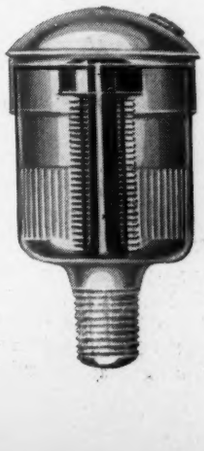
The center pin which forms the positive pole, being itself of tapered construction, is passed through the center of the tapered tube, which makes the mica tube absolutely oil proof. The top of the tube and center pin is covered with mica washers and pressed together under heavy pressure.

The large chamber affords ample room and tends to eliminate soot. The negative electrode, which is made of 95 per cent nickel alloy, is firmly embedded in the shell. Copper asbestos gaskets are placed between the bushing and shell, which is claimed to prevent leakage at that point. This also makes the shell of the plug easily detachable for cleaning purposes.

Oil-O-Matic Oil Cup

By using the Oil-O-Matic system of lubrication such parts as the steering spindles, steering connections, fan spindles, springs, spring bolts, etc., are automatically lubricated by clean cylinder oil. It is manufactured by the Champion Mfg. Co., 74th and Kimbark Ave., Chicago, Ill., and sells at $.80 each.

The Oil-O-Matic is an individual automatic oil cup which replaces grease cup, gravity oil cup, oil filler cup and wick oiler. Its spherical cover keeps out all dirt, and the taper thread keeps in all the oil. The plunger is balanced on the spring and any movement of the vehicle causes it to move up and down, thereby lifting the oil to the top of the stand-pipe, from which point it is fed by gravity through the center opening to the bearing. It feeds most when the road is rough and does not feed when the vehicle is standing.



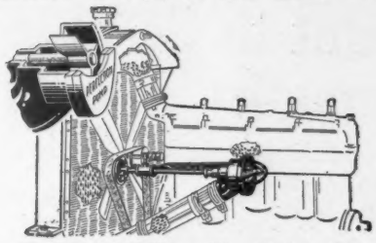
Oil-O-Matic Oil Cup

Its cover keeps out the dirt and its tapered thread keeps the oil in. There is a plunger within, balanced on a spring, the movement of the car causing this to raise and lower, lifting the oil to the top of the stand-pipe, allowing it to run to the parts to be lubricated.

Perfection Water-Circulating Pump

The Perfection water-circulating pump embodies the centrifugal principle. Positive circulation is said to be maintained no matter how slow or fast the pump is running. It is manufactured by the Felker Bros. Mfg. Co., Marshfield, Wis.

The danger of freezing the radiator is minimized as this pump keeps the water moving so that the temperature is held uniform throughout the entire cooling system, and stops the water in the jacket from boiling and evaporating the alcohol or other anti-freeze solutions that may be used. In the construction of this pump the body casting is in one piece, thus assuring perfect alignment of the bearings, which are oversize. The list price, including Vulco Cord Belt and cap screws to attach, is $10.

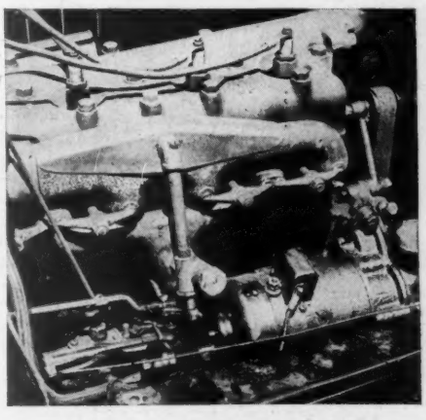


Perfection Water-Circulating Pump

This is a device adaptable to the Ford car which keeps the water circulating, thus preventing overheating, and also freezing in cold weather. It is driven, as shown in the illustration, by the fan belt.

The Pledger Accelerator

The claim made by the Pledger Accelerator, manufactured by the Pledger Appliances Co., Inc., New Orleans, La., is an effective gas-saving device. By applying heated air into the intake manifold through a special valve, it is stated to afford better carburetion. The heated air is taken from over the exhaust manifold through the brass heater. This heated air is automatically fed to the engine at the same time as the gas, and in conformity with the various speeds of the engine, introduces a highly efficient mixture into the combustion chamber.

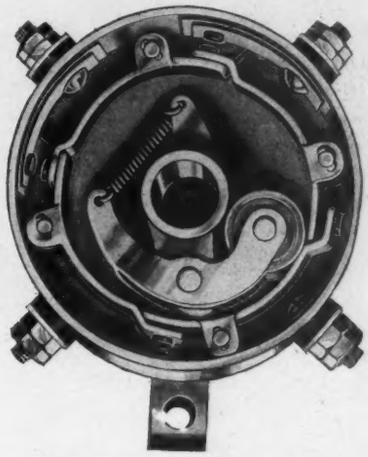


Pledger Co.'s Gas-Saving Accelerator Attached

Duplex Double-Duty Timer

The magneto contact of the Duplex timer gives to each cylinder a direct contact between two tungsten points, timed by a single roller.

The only revolving part is a roller similar to that in the regular Ford assembly, but instead of a solid steel roller, the Duplex roller is a double-roll enclosed type of ball bearing with sufficient lubrication on assembly to last indefinitely. No electrical current is carried through the roller to cause electrical wear on its surface.



Duplex Double-Duty Timer

The case is of solid, stamped, cold-rolled steel, said to prevent condensation of moisture. All joints between fibre points and case are filled with high-grade electrical varnish baked at a high temperature, eliminating water pockets between the case and current-carrying parts. It has Tungsten points, 5/32 in. diam. The retail price is $5. West of Rockies, $5.50. It is manufactured by the Duplex Products Co., 3520 Princeton Ave., Chicago, Ill.

Rush Piston Ring Extractor

The time and labor saving advantages, in addition to its ability to remove a piston ring without scoring or otherwise injuring the ring or piston, are the features of this device. It is manufactured by the W. S. Rush Co., 2213 N. Broadway, Los Angeles, Cal., and sells at $1.50. With this appliance all standard rings, either left or right cut, including mitre or angle cut, step cut, square cut, can be removed from or replaced on a piston in a surprisingly short time.

It is operated as follows: Place thumb and middle finger in handles, spread them apart until teeth are in a position to engage the ends of the ring, then press out of ring groove with other hand so that teeth easily engage the ends of the ring, close the finger, draw the handles together gently, spreading the ring until it can be lifted off easily.

Rush Piston Ring Extractor

SERVICE AND REPAIR DEPARTMENTS

Conducted by C. P. SHATTUCK

Service Paramount to Sales in Merchandising Pneumatic Truck Tires

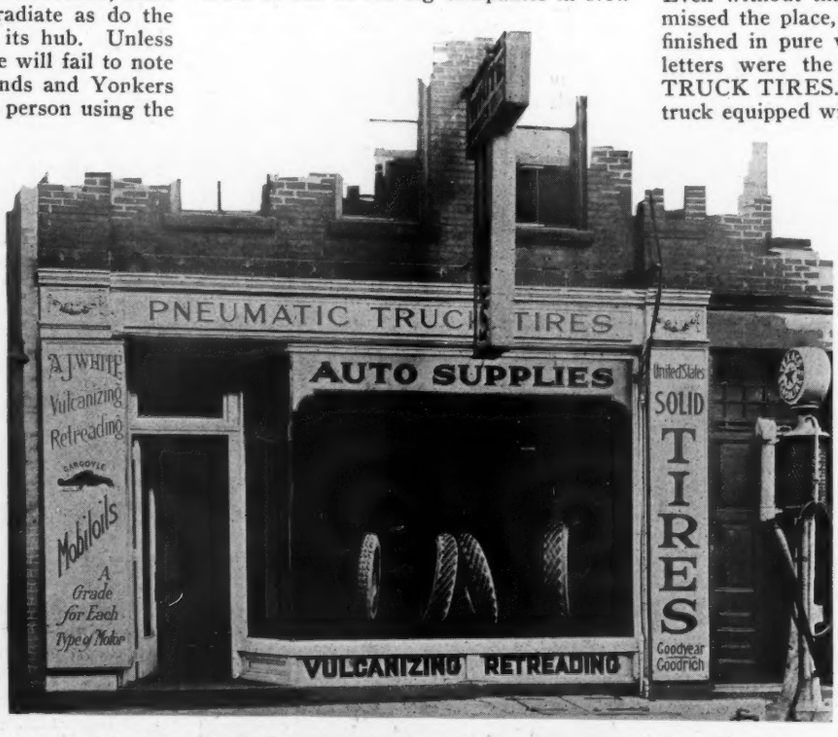
YONKERS, N. Y., is in Westchester County, is thirteen miles from Columbus Circle or 59th St., New York City, and has a population of 100,000. Trucks and passenger cars going north ,to Albany or up state from New York, swing out of Columbus Circle and follow Broadway to Getty Square, Yonkers, which is a replica of Columbus Circle insofar as traffic is concerned, there being five roads which radiate as do the spokes of a wheel from its hub. Unless one is a close observer he will fail to note where New York City ends and Yonkers begins. And the average person using the heavily traveled road between New York and Yonkers does not know the line of demarcation.

It is a beautiful road from Columbus Circle to Yonkers and is much favored by truck traffic as well as motorists. There is an excellent train service between the two cities, and the subway runs to 242nd St., or Van Cortlandt Park, and a 24-hour trolley service connects the subway terminal with Yonkers. There are dozens of express concerns operating trucks between Yonkers and New York and serving the suburbs and towns along the Hudson above Yonkers. Industrial concerns transport their raw material and finished product to and from New York by trucks.

Is Convenient to New York

These facts are mentioned to show that although contiguous to New York, and well served insofar as transportation is concerned, one would naturally deduce that the bulk of the tire replacement and repair business of Yonkers would go to New York, where the manufacturers have branches and service stations and where competition is keen in merchandising truck tires.

The writer held the opinion that because of the conditions outlined that a tire dealer handling truck tires, particularly the big pneumatics, would find it tough sledding to achieve success in handling truck tires in Yonkers and mentioned the fact to the head of the truck tire department of one of the big companies in New York. Much to the writer's surprise, he was informed that there was a dealer in Yonkers who was not only selling the solid truck tires but doing a real business in the giant pneumatics, so, armed with the dealer's name and address, the writer drove out Broadway, threaded the maze of Getty Square traffic and turned into Warburton Ave. Traffic was unusually heavy that morning and one had no time to study numbers. Vehicles standing on either side of the avenue and a two-way traffic street requires one to watch his step.



An Exterior View of A. J. White's, in Which Pneumatic Truck Tires Are Well Exploited

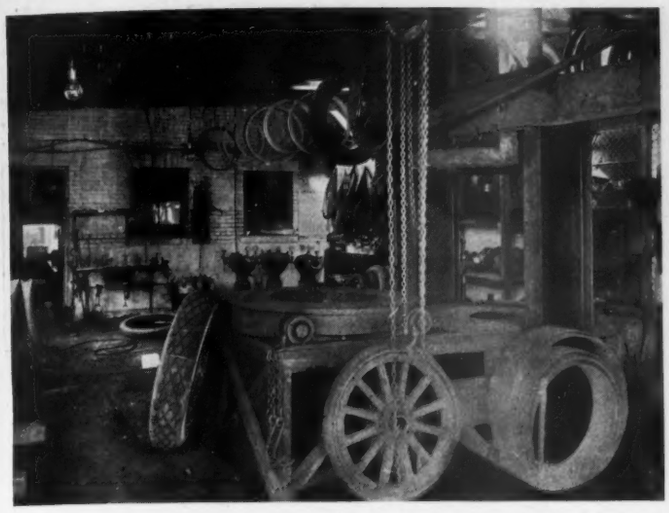
White is a great believer in window displays as the illustration shows

But there was no need of numbers, for the tire dealer believes in signs. A few blocks after turning into the avenue, and on the right-hand side traveling north, the writer's attention was caught by a large illuminated sign in the shape of a T—no, it was not illuminated, but is at night—and the signed spelled truck tires. Even without that sign I could not have missed the place, for the entire front was finished in pure white and in large black letters were the words "PNEUMATIC TRUCK TIRES." About this time, a big truck equipped with the giant pneumatics, where the driver had been inflating one of the shoes, affording a view of the window. As the display is reproduced the reader can judge for himself if it is one that is attractive or not.

As the writer pulled up in front, stopped his car and was climbing out, a young man came out of the store and approached him. This young man glanced over the car—it was the tires he was surveying — and remarked, "You've got a flat shoe, Hey, Bill." Bill responded promptly. He had seen service in the big conflict and was Johnny on the spot. He was back in a few seconds with a jack and before the writer realized it the offending tire—or rather, wheel —was jacked up. "Some speed," thought I, so I signalled to continue with the good work.

Are Permeated With Sales Effort

It was a wire nail that caused the trouble, but there was more trouble in store—for Bill called me into the repair room and before I knew it he had sold me a new tube, demonstrating that the tube



The Repair Shop Equipped With Moulds Up to and Including 10 Inch

Note the solid tire press, falls and tackle and table on wheels, making handling of wheels an easy matter for one man. The arrangement was designed by A. J. White

had outlived its usefulness. And, not content with that, he sold me a new flap. Now the writer knows a little about tires, tubes and flaps, and has bought many, but it was the first time he was really quickly and convincingly made to buy by a repairman. Generally the salesman or the dealer—not the repairman—does the merchandising.

While Bill was installing the new tube and flap and putting the shoe on the rim, I asked him who the young man was that met me at the door. "Oh, him? Why, that's the boss, Alec White," was the reply. And it was A. J. White that the New York factory man said was the chap who was selling truck tires despite the fact that Yonkers was so close to New York. I was about to introduce myself when Len Black, who is putting over the Pierce-Arrow trucks in Westchester county, blew in, and before I knew it Len and I became involved in a discussion of salesmen and their methods of merchandising highway transportation. And so it was Len who really introduced me to Alec White. And before I could get his ear a salesman for Alemite arrived and began to demonstrate the advantages of Alemite for truck lubrication. Len and I resumed our discussion and when the Alemite salesman got through another character was injected.

A New Angle to Service

This man had a passenger car differential with a ring gear and the teeth of the latter were stripped. Both White and Black stepped up and there followed a discussion of ways and means for securing a new gear, as the man said the New York factory branch could not supply a gear. Finally Black said he believed he could find one in New York and that he would have the old gear taken off and the new one put on, and that he would attend to it that afternoon. Needless to say, the owner of the gear departed much pleased and said so.

Glancing at my watch, I saw it was lunch time, so broached the subject. At lunch I ventured the remark that it was a new one to me to see a tire dealer and truck salesman giving service on passenger car parts. The answer was this. The man is an officer of a large Yonkers corporation operating six Pierce-Arrows and he buys his tires from A. J. White. Simple, isn't it? A case of service aiding service and sales.

After lunch, when Black had departed for New York in his search for the ring gear, I took the story of White's career from him piece meal. I say piecemeal, for we were frequently interrupted by customers and salesmen. Pieced together, here it is:

Started as a Repairman

Seven or eight years ago A. J. White was a tire repairman and a good one, too. Being ambitious, he realized that to make real money one must be in business for himself, so he started in a modest way and grew. He grew and prospered because at the outset he **believed that service was the foundation of successful merchandising** and that to give service one could not give away profits in the form of discounts. From the start he practiced the rule of courteous treatment, a square deal, one price, personal contact with customers plus hard work. Of course, his work had to be good and his price satisfactory.

Today if a stranger has tire trouble, truck or passenger car, and asks the traffic officer or a citizen who to call on, the answer will invariably be "White." This reputation has been built up by service that satisfies, by retaining business once gained. One-time sales, no matter how profitable, are not sought, for it is the 365-day-in-the-year trade that White cultivates and keeps.

As previously mentioned, it is the service that has made White a successful merchandiser of truck tires. He sells and services barrels of passenger car tires, but this article is not intended to explain how he sells them, but truck tires—the big pneumatics. A 24-hour service, plus the efforts of J. J. Hayes, the truck tire salesman, are what put over the sales. Both White and his salesman meet with competition—lots of it. The tire companies of New York and the dealers in Yonkers know that Yonkers and Westchester county is a fertile field and all cultivate it intensively. And there are the usual discounts in their various forms offered as bait for the owner or purchasing agent of the corporation, but despite the questionable methods, A. J. White continues to sell and increase sales.

No Need of Inducements

The writer has heard the wails of many tire dealers in various cities where competition is as keen as was selling lightning rods or sewing machines in former days. They say, these dealers, that you have got to make inducements to get the business. A. J. White says it is not essential, neither is it good business. He and his salesman, who is a live wire, sells in the face of New York and local competition by selling service first and the tires afterwards. Right away I hear the truck tire dealers and truck dealers, for that matter, get out the hammer or say that White is an exception, but let us analyze White's methods. Take, for example, a big corporation on the Hudson that is buying its tires for its big trucks and industrial trucks from White. Now, this concern operates a big fleet of trucks and its purchasing agent is not exactly ivory from the feet up. His business is eagerly sought by all tire salesmen for it represents quite a sum annually.

Hammers on the Service Angle

Now, when Hayes went after this business, he met competition. Did he talk prices? He did not. He talked service. He knew that in the case of this concern that whenever a truck was idle during its working hours the loaders and others were idle also. Figured out in dollars and cents, this would, if the truck was laid up while a tire was being replaced or repaired, mean a loss. And

The Big Pneumatics Are Displayed in the Store as Well as in Window.

Showing one section of the salesroom given over to lubricants. Oils and grease are ordered in carload lots and sold. Standard accessories and supplies are also merchandised.

Hayes knew the loss. So when he went after the business he talked service, told the purchasing agent that A. J. White had been in business so many years. He was equipped with every appliance for efficient and economical repairs and replacements. He had a tire press and moulds for pneumatics up to and including 10-in. He hammered on the fact that the service was 24 hours-the-day and every day in the year, including leap year, and he told the purchasing agent that a space was set aside in a nearby garage where the truck could be driven in after the day's work and taken out the next morning with one or four sets of tires pressed on or pneumatics changed all around. He said that the big pneumatics could be repaired, tubes vulcanized, etc., with the same speed. And the purchasing agent was informed that if any of his trucks, night or day, while on a trip, had tire trouble, anywhere and any place, the agent or his man could call up several numbers and the White service truck would be prompt in responding and the work done on the road, if need be.

Selling the Big Pneumatics

Now, let us assume that the purchasing agent talks the big pneumatics. He may be really interested or fishing for information. Now, this is where Hayes shines. Suppose the agent says he is thinking of changing over one of his trucks from solids to pneumatics, but does not want to lay up the truck. Hayes comes back with the statement that he will guarantee to make the change in 24 hours. And this is how it is accomplished. The customer is told to drive the truck in after the day's work. Let us say that the truck comes in at 5.30 P. M. The wheels are taken off and placed in the service wagon and at eight the next morning are at the wheelwrights in New York, with whom White has a special arrangement. At 3.30 the wheels have been cut down and the rims are in place. At 5.30 P. M. the tires have been put on and inflated and the truck is ready. This is an actual case of the service rendered on the giant pneumatics.

It must not be understood that Hayes always sells his prospect on his first call or his second, or his third, but the constant hammering on the service angle will either convince the prospect or he will investigate the service claims. Now, after several years of successful service, it is the easiest thing in the world for Hayes or White to supply the purchasing agent or prospect with the names and addresses of big concerns, customers, and satisfied ones.

Turns Down the Shopper

Of course, White and his salesmen run up against a lot of the "I will give you"—the shopping type of customer. An example of how this is handled and the reason why bargaining is like a boomerang will be explained. A certain owner of trucks who was in the market for some truck tires came to White. The list-price was quoted. Let us say that it was $116. This man was a shopper. He remarked that he could get the same make cheaper and put on, but he would give $100 a tire. Now, at that price there would be a fair profit, but the offer was turned down.

The Service Wagon Delivering a Giant Pneumatic
This truck is well lettered and is especially equipped for roadside repairs

Why? Because there is but one price and if the price was cut there would be a probability that this man would boast to a neighbor, another truck owner, that he bought his tires for so much. And it can be easily understood that shading the price for one leads to other customers demanding similar discounts. And big concerns lose confidence in a dealer who has a price to meet the occasion. **The dealer with one price can afford to lose the shopping type of customer, for the shopper rarely buys twice from the same dealer.** It may take courage to refuse a sale when business is dull, but it is the stable policy that wins out in the long run.

It is the service angle that has and is making White a successful merchandiser of tires. Hayes has data on truck tires, solids and pneumatics, and keeps posted on what tires do and do not do. Effort is not made to sell any particular make, for the company has three lines to offer the buyer, Goodyear, Goodrich and United States. Should a customer fancy a make is not satisfactory another can be offered, and one of the selling talks is that a prompt adjustment is made. There is no sending of the shoe away for adjustment or delays.

Needs Real Salesmen

The point to this story is that A. J. White and his salesman are selling the pneumatics for trucks. At first there was considerable sales resistance. It takes real salesmanship to convince an owner of a truck equipped with solids that it is economy to change over to the big pneumatics, especially when the owner figures that it will lessen his bank roll from $800 up. And when you separate a man from $1,000 you have got to sell him something other than a theory.

Effort is not made to sell pneumatics unless there is something tangible to pave the way. Since the use of the big pneumatics Hayes has gathered together all available data on their costs. This includes comparative costs in various industries and costs kept by the truck owners sold. An in this respect White has able allies, thanks to his service policies. Whenever a man becomes interested in the big shoes costs are quoted him and the names and addresses of users sold are given to the prospect. And there is quite a bunch of letters and lots of data available.

Service That Paid

Speaking of service, an instance of how serving an owner of a truck equipped with pneumatics resulted in a sale and other sales is cited. The owner of this truck runs from up State to New York, the round trip approximately about 300 miles. While making the return trip, at night, one of the big shoes was punctured. Efforts to secure service failed until some one advised the owner of White. The latter secured the service car and drove to the truck on the road, pulled off the big shoe, went back to the shop, vulcanized the tube and replaced it. Now the charge for the work or amount received was not profitable, but it was service. The man was so delighted that on his next trip he stopped at the store and talked about changing over the front tires to a larger size. And a sale was made. Later this man changed from solids to pneumatics and on his round trip of 300 miles his cost figures showed a saving of 12 gallons of gasoline. This man is one of the big boosters for White service and has been indirectly instrumental in sales. Many other instances could be quoted to show how service has boosted the sale of solid truck tires and how it has aided in the merchandising of the big pneumatics.

Urge Buying of Spares

Effort is made to interest a user in carrying a spare when the prospect is engaged in long haul work. Local trade is urged to stock a spare and to store it at White's, where it will be readily available in case of trouble. Inspection is a part of the service plan on both solids and pneumatics. Customers are educated to send their drivers at stated periods to the store where the pressure of the pneumatics is tested and the casing looked over for cuts, etc. This affords an excellent opportunity to note the condition of a shoe and supplies leads for sales.

With the 24-hour service there is much night work to be done, for the majority of the big concerns send their trucks in after the working day. The repairman, as well as White and Hayes, can be called

on any hour of the night, as an arrangement or schedule is arranged among the men.

As has been stated, the service angle is the big selling talk. Some prospects say that their trucks run to New York, therefore they can have tires put on and serviced there without loss of time, but this argument is refuted by showing that the work will be done during the day when the truck should be operating. When supplemented by cost figures on certain capacity trucks the argument in favor of local service generally wins.

Fine, all this talk about service selling the tires, and White getting list prices, but does he really sell any of those big tires, asks the reader? The answer is he does. This year, and it hasn't been one of the best for pneumatics to date, has resulted in the merchandising of over 100 truck pneumatics, of which number, about 65 per cent have been standard truck pneumatics and the balance big fellows. And White is selling the shoes to the truck dealers in and around Yonkers, but the bulk of his business is obtained by digging it up and when he gets it he hangs on to it. How? Why, the answer is apparent. It's service.

SOLID TIRES

Date Received	Serial Number	Cost	Selling Price	Profit	Loss	Name	Address	Wheel	Date Sold

The Perpetual Tire Inventory Used for Both Solids and Pneumatics Was Originated by A. J .White and Statement is Made That Entire Stock Can be Inventoried in Less Than One Hour

The size of tire is marked on left-hand upper corner, and both sides of the card, which is 8½ x 11 in., are used.

The Motor Truck and Its Relation to the Distribution of Petroleum Products

By F. A. BEAN, Consulting Engineer, Wayne Oil Tank & Pump Company

UNTIL very recently—within the last three years, the tank trucks used by the oil companies have received comparatively little thought and less care. The result has been that the cost per gallon for delivery to the customer or the filling station has been considerably higher than necessary.

The major portion of the blame for this condition rests with the oil companies, although some of it is chargeable to truck salesmen and to truck tank builders. This has not been malicious or intentional, but is the result of ignorance of operating conditions.

It is quite evident that there is something radically wrong when one company shows a delivery cost in a certain city ranging from two to two and a half cents a gallon, while another company operating under almost identical conditions in the same city, shows a cost ranging from four-tenths to seven-tenths cents per gal.

Fail to Check All Items

The manager who has carefully analyzed the various factors entering into the cost of delivery is the one who is delivering at a cent or less per gal. A number of managers believe they are delivering below the one-cent mark because their bookkeeping departments are not given sufficient data and are not taking into account all of the items.

There are a large number of the smaller independent oil companies who haven't the faintest idea what their delivery cost is; furthermore, they are not taking any steps to find out and the writer has talked to some managers who haven't even an idea how to inaugurate a system that will give them the desired information or what items should be taken into account in order to determine what their trucking costs really are. This is not an exaggerated statement.

A high delivery cost may be due to any one of a number of causes or to a combination of them. Among them are: the use of an improperly designed truck or tank; the use of trucks of a wrong capacity on a certain route; too great a mileage for the gal. delivered; improper routing; excessively high maintenance charges due to overload; under-tired vehicles, or poor inspection and repair methods and to high operating costs of the truck resulting from poor loading and unloading facilities or from carrying an under-load. There is also a great deal chargeable against careless, untrained and generally indifferent operators.

How Some of These Items Affect the Final Costs

Every possible item of expense connected with the truck must be taken into account when calculating the cost of delivery per gal. It necessarily follows that if we can design, operate and maintain our trucks, so that we have reduced the cost of delivery per gal. a fraction of a cent, we have added that same amount to the profits on every gal. we sell. It is necessary before we can make efficient any system for either maintenance or operation that we have the proper trucks.

The first thing necessary is to determine on a specification that will give us the truck with the lowest operating and maintenance charge in this particular line of work. Experience has already taught practically all truck operators two very important lessons.

The first is that the truck that is cheap in price at the time of purchase rarely develops to be a cheap truck from an operating viewpoint over a period of years. The second is that in operating a fleet of trucks in either one of a number of cities it is very costly to experiment with several makes of trucks. Using only one make of truck very materially reduces the cost of repairs, and simplifies all the problems of service, the stocking of repair, etc. The use of only one make will greatly assist the truck manager, repairmen and driver to learn the mechanical peculiarities and thus come more nearly to 100 per cent. operating efficiency.

The standardization of equipment will help in the solving of various loading and operating problems; will cut repair shop and repair part stockroom space and cost; will cut fuel consumption; will make easier the planning of garages, repair and paint shop, loading racks, etc.; will reduce the labor required at large distributing plants and simplify the accounting system. It will also allow the interchange of bodies on units of like capacity and make the design of these bodies a much easier problem.

Sizes Depend on Business Handled

The capacity of the trucks to be used will depend entirely upon the territory to be served and the business to be handled. The sizes which are giving the best average results range from one and a half to three and a half tons.

The three-quarter-ton and one-ton trucks very seldom earn their way at small stations, but have been used to good advantage in making emergency deliveries, when attached to a large fleet of trucks in the larger cities.

The trucks of from four to seven and a half tons capacity have given very good results in large dump load service on good roads and where the routes were of comparatively short mileage.

One thing to be remembered is that on routes where the gallonage will warrant, it is cheaper to operate a five-ton truck than two trucks of one-half that capacity.

SPECIFICATIONS FOR MOTOR TRUCK CHASSES

All motor truck chasses to be used in the distribution of petroleum products shall conform to the following specifications and all bids tendered shall be based on those specifications and shall include all items herein.

If a tender is made on tank or stake body it shall be made separately and not included with the bid covering the chassis.

TIRES: Chassis shall be equipped with either solid or pneumatic cord truck tires at the option of purchaser and shall conform in size to those shown in the tabulation given herewith.

When solid tires are specified they shall be of the single, fluted, pressed on type. Pneumatic tires shall be of the straight side type.

WHEELS: Wheels shall be either wood of the artillery type or solid metal disc type at the option of the purchaser.

RIMS: Rims shall be of such size and design as will properly care for the size and type of tires specified.

ANTI-SKID CHAINS: Eight unit anti-skid chains of proper size and with the necessary fastenings shall be furnished with each chassis. The fastenings shall be delivered installed on the wheels.

HUBODOMETER: A hubodometer of approved type shall be furnished and installed on left front wheel.

GOVERNOR: A speed governor of approved type shall be attached to the engine and shall be set to such speed as is indicated in the accompanying table.

BUMPER & RADIATOR GUARD: All chasses shall be equipped with bumper in front and a metal radiator guard, both of approved type.

TRANSMISSION SPEEDS: Each chassis shall have one reverse speed and the number of forward speeds shown in the table.

TOWING EYES OR HOOKS: Each chassis shall be equipped with a pintle hook or eye installed on each corner of the frame.

CABS: Each chassis shall be equipped with a cab of wood or steel construction and equipped with rear window, wind shield, side curtains, seat and cushions.

LIGHTING SYSTEM: Each chassis shall be equipped with a complete electric lighting system including 6-volt battery, battery box, generator, two head lights and one tail light, with all wiring in conduit.

WARNING SIGNAL: The chassis shall be equipped with an approved electric horn.

TOOLS: Each chassis shall be equipped with a full set of tools including a jack of such size as to operate under the truck with which it is furnished, when fully loaded. A tool box of sufficient size to hold all of the tools and securely fastened to the chests and fitted with a lock and key shall also be furnished.

TIRE PUMP: When the chassis is to be equipped with pneumatic tires, a tire pump of sufficient capacity shall be installed in connection with the power unit and proper provision made for its operation from the engine.

DRAWING: The manufacturer shall submit to the purchaser detailed dimensioned drawing and descriptive matter covering the chassis, engine horse power, ignition system, wiring plan, carburetor and size oiling system, cooling system, wheels front and rear, type of rims and tires, exact location of muffler and exhaust, gear ration, chassis weight as regularly equipped by the manufacturer, also the exact weight of all additions made under these specifications, body allowance weight, extreme length over all and extreme width hub to hub, length of frame back of seat, overhand and frame beyond wheelbase frame width, height of frame, at rear without body and with body fully loaded, height from ground to top of cab, length of wheelbase, turning radius, per cent of load on rear wheels including body when loaded, a detailed description of all equipment herein specified and showing where and how the same is installed, including the lighting system with wiring diagram, cab, governor, hubodometer, anti-skid chains, bumper, radiator guards and towing eyes, and a list of all equipment included in the regular chassis weight specified by the manufacturer.

PAINTING: All chasses shall be delivered in the lead unless otherwise specified. When the completed painting is to be done by the truck manufacturer it shall be in accordance with the specifications which will be furnished by the purchaser. A separate bid shall be made to cover the painting.

Truck Capacity in Tons	Recommended Sizes				Governor Speed of Truck in Miles per Hour		Transmission Speeds Forward
	Solids		Pneumatic Cords				
	Front	Rear	Front	Rear	Solid	Cords	
¾	X	X	34x4½	35x5	X	27	3
1	X	X	34x4½	36x6	X	25	3
1½	36x4	36x6	36x6	38x7	18	22½	3
2	36x4	36x8	36x6	40x8	16	20	4
			38x7	42x9	15	18½	4
3	36x5	36x10	38x7	44x10	14	17	4
3½	36x5	36x10	XX	XX	12	15	4
4	36x6	40x10	XX	XX	12	14	4
5	36x6	40x12	XX	XX	12	X	4
5½	36x6	40x12	XX	XX	12	X	4
6	36x6	40x12	XX	XX	12	X	4
7	36x7	40x14	XX	XX	12	X	4
7½	36x7	40x14	XX	XX	12	X	4

Analysis of Chassis Specifications

The accompanying chassis specifications have been drawn from the results of the experimental experience of several of the largest oil companies and also embody the opinion of some of the best automotive engineers and tire experts.

Because of the class of work to which trucks in the delivery of gasoline and other petroleum products are placed, their maintenance charge is usually much higher than it would be in other lines of industry for a similar mileage or period of time which in turn increases the cost per ton-mile or per gal. of delivery.

The principal reason for this is the unusually hard service that the trucks are called upon to perform and that all trucks are designed to be operating at their maximum efficiency when fully loaded.

It is impossible in this class of delivery to have the truck loaded on the home trip, thereby reducing the operating cost. It is very seldom that a tank truck will return with any considerable portion of its outgoing load. If it does, as a regular occurrence, it indicates that the wrong capacity truck is on that particular route.

In a great many cases the tank will be partially empty when it has completed only a portion of its outward trip. If the truck is traveling over a rough road at a moderate or even slow speed or over a good road at the maximum speed allowed by its governor, the semi-filled condition of the tank causes the partial load to keep shifting, even though the tank is equipped with surge plates. This shifting of the load sets up strains, not caused by other classes of hauling, in the engine, frame, drive, shaft, universals, etc., and which, to correct, requires a careful and rigid inspection system and which in turn adds to the maintenance cost.

Keeping this thought in mind, extreme care should be used in purchasing the chassis. If specifications are carefully written at the outset, the truck company and their salesmen will know just what is expected by the oil company and it will save a great deal of useless argument and a considerable loss of time.

Chassis Should be Carefully Equipped

It must, of course, be understood that a chassis delivered in accordance with a rigid specification will involve a greater first cost, but on the other hand the maintenance and operating cost will be reduced during the normal life of the truck to such an extent that the final cost should be considerably lowered and therefore the unit cost of delivery of this same period will be lessened.

Let us consider carefully just what these specifications should be for trucks of all capacities. The specifications contained in this article have been written to include all accessories and detached equipment not usually included in the chassis price.

It will be found that it is usually cheaper to have all such equipment as lighting system, bumpers, etc., which by some companies are not considered as a part of the chassis, furnished and the complete assembly delivered by the truck company, than to try to buy the accessories separately from various companies and assemble them afterward.

Tank and body specifications will be considered later.

The first item written into the following specifications is that of tires. It is generally agreed that the pneumatic is the proper tire for the smaller capacity trucks, from the standpoint of increased speed, increased traction, increased tire mileage and reduced chassis maintenance on account of reduced vibration and resulting decrease in actual depreciation and decreased fuel consumption. It must not be thought that the pneumatic cord tire has no faults. Against the above are some features which tend to slightly offset them; they are the high cost, the reduction of high gear ability, limitations

on braking power and time consumed on road in making changes.

It has been the writer's experience that when solid tires are used, either in the city or on country roads, they should be of single type. The dual type of tires will not wear evenly on both the inside and outside of the same wheel or on opposite wheels. This condition necessitates the dual tires being changed more often than single tires, otherwise one wheel will be carrying more than its proportion of the weight, which causes severe strains in various parts of the chassis. A similar condition exists when a wheel equipped with dual tires, meets an obstacle not large enough to engage both tires. The result is a tire temporarily overloaded and consequently unable to protect the truck mechanism from the resulting shock.

Oversize Tires Are Recommended

Comparatively few trucks are delivered from the factory, except on special order, with tires sufficiently large to give the very best results. The oversizing of the tires on a truck will do just as much to increase the life and reduce the maintenance cost, fuel bills, etc., as the same practice will on a passenger car.

However, it must be remembered that there is a limit to this oversizing. A tire that is too large is as grave a fault as one that is too small. Do not confuse "oversizing" with "overtiring." If the rear wheels are overtired for the weight to be carried the motor becomes overloaded unless the chassis was originally overpowered. When the front wheels are overtired there is a tendency for the truck to steer hard and an unnecessary strain is brought upon the steering knuckles.

The table showing tire sizes has been very carefully prepared and engineers generally agree that it will give good results on the majority of trucks which are suited to the distribution of petroleum products.

To a fleet of trucks covering all of the capacities it will mean the stocking of a minimum of sizes and the stocking of no sizes which are in line to become obsolete so far as is now known. The great range of sizes now being furnished by the various manufacturers is due to the variance in the weight of the chassis and the distribution of the load between the two axles; also to the practice of a great number of the truck manufacturers in furnishing the tire companies the specifications of their truck and then using the smallest size tire which can possibly be expected to carry the entire weight of the truck with its load, although in many cases it is not the size recommended by the tire manufacturer as being the proper one to give the most economical mileage. This is done for the purpose of reducing the cost of the chassis and is, of course, a question entirely of trade competition.

The better way is to accurately ascertain the weight of the chassis; add to this the weight of the body and live or pay load; ascertain the percentage of load applied to each axle of chassis in question and then specify the size of tires desired.

To facilitate this work the following tables show the range of maximum weights as recommended by tire manufacturers for the various sizes of both single solid tires and pneumatic cords. The figures shown in heavy type are those most generally used.

TABLE SHOWING RANGE OF MAXIMUM LOADS FOR PNEUMATIC CORD TRUCK TIRES
as Recommended by the Principal Tire Manufacturers
Figures in bold face type show loads most generally recommended.

Inflation Pressures	Load Capacities							
	4″	4½″	5″	6″	7″	8″	9″	10″
60 lb.	**850**	1020	1400	....	....	....	....	....
65 lb.	...	1080	1500	....	....	....	....	....
70 lb.	...	1140	1550	1800	....	....	....	....
75 lb.	...	**1200**	1600	...	....	....	....	....
				1800				
80 lb.	...	....	1700	2000	2500	3175	....	....
				2000	2450			
90 lb.	...	....	....	**2200**	2700	3450	....	4000
					2775			
				2000	2700	3350		
100 lb.	...	....	....	3000	**3000**	4350	....	5000
					3725			
					2950	3650		
110 lb.	...	....	....	2400	4000	**4000**	4300	5300
						4675		
120 lb.	...	....	....	....	3200	3950	4650	5350
						5000	**5000**	5650
								5800
130 lb.	...	....	....	....	....	4250	5000	6000
140 lb.	...	....	....	....	....	....	5350	6250
150 lb.	...	....	....	....	....	....	....	6700

TABLE SHOWING RANGE OF MAXIMUM LOADS FOR SINGLE SOLID TRUCK TIRES
as Recommended by the Principal Tire Manufacturers
Figures in bold face type are the loads most generally recommended.

Sizes of Tires	Pounds Capacity
3 in.	**1000**
3½ in.	1000
	1300
4 in.	1500
	1700
5 in.	2000
	2500
	2600
	2650
6 in.	**3300**
	3500
7 in.	**4200**
	4500
8 in.	5000
	5200
	5600
10 in.	6750
	7000
	7500
12 in.	8500
	8800
	9500
14 in.	**10600**
	11500

Under ordinary conditions there is very little choice between the solid steel disc and artillery type of wheel. When oversizing the tires care must be used that the proper sized rims are furnished. A solid tire overhanging a rim more than three-quarters of an inch will soon break down and shorten its life very materially.

The experiments conducted by several companies show that four anti-skid chains on each rear wheel will give all of the traction necessary and at the same time produce the least tire wear. All trucks should be equipped with a first-class hub-odometer, which cannot be tampered with. A careful record of daily odometer readings is the only method by which drivers, cost of delivery, etc., can be accurately determined and checked.

The table attached to the specifications gives the maximum speeds at which governors should be set on the trucks of various capacities under the best of operating conditions. These may have to be changed under certain road conditions. The National Automobile Chamber of Commerce has recommended speeds varying from three to five m.p.h. less than those shown in the table.

For instance, they recommend a speed of 14 m.p.h. on the one and one-half-ton truck and 7 m.p.h. on the seven-ton and further recommend that when these speeds are exceeded to any great extent that the truck manufacturer withdraw the warranty.

All right-minded men will agree on one thing and that is that no truck should be operated on city streets or other places of congested traffic at such a speed that its momentum will be great enough to endanger its being under perfect control at all times.

The maximum speed of any truck is dependent upon the piston speed of the engine. The gear ratio of nearly all trucks is such that speeds greater than those shown in the table cannot be made without increasing the piston speed to such an extent that the vibration becomes excessive.

The speeds for trucks equipped with pneumatic cord tires are more or less theoretical at the present time, but have been shown in the table low enough to properly protect the truck mechanism, and also properly protect the other vehicle traffic and pedestrians.

The more conservative engineers place this increase from 20 per cent. to 25 per cent., others say 50 per cent., and some over enthusiastic salesmen will tell you that you can safely increase it 75 per cent. to 100 per cent.

The fact that the pneumatic tire is of greater diameter than the corresponding solid tire used on the same truck will give a slight increase in speed.

One thing is perfectly sure—you cannot overload, over-speed, under-tire, under-maintain or under-inspect, your truck without paying the penalty by deducting from the profit side of your ledger.

There is no question but that the enormous depreciation and repair bills of gasoline distributing trucks in the past has been in a large measure due to being driven at excessive speeds when empty or with a partial load which is continually shifting.

The writer recently witnessed one of the two-ton trucks of a large oil company driving through the principal business street of one of the largest eastern cities at a speed of more than 20 m.p.h. The rear wheels struck a street car crossing with such force that they left the ground at least four to six in. and one of the filling openings which was without a plug slopped out a considerable amount of gasoline.

(To be continued)

How to Repair Bosch DU4 and ZR4 Magnetos

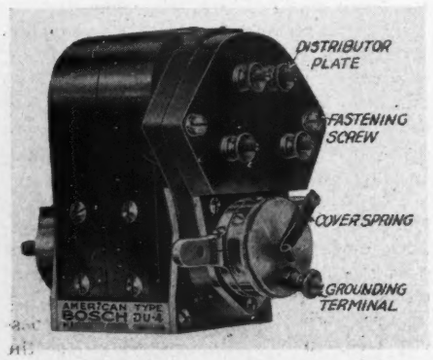
This Article Deals Only With Such Repairs on Bosch Magnetos Which Should be Attempted by the Service Station or Garage Mechanic

THE American Bosch Magneto Corp., Springfield, Mass., manufacturers of the Bosch line of magnetos, draws the line very carefully between that work its officially appointed service stations may do and the repairs or adjustments the mechanic of the truck dealer may accomplish. This policy of limiting the work the average mechanic should do is based on the desire of the company to afford better service to users of its products. It is pointed out that years of experience in the ignition field, coupled with the use of most modern equipment and careful inspection, have resulted in a dependable product; but that even a well-made article, when disassembled by one not familiar with it or the factory methods, will suffer from abuse. So the American Bosch Magneto Corp. limits the amount of work the truck mechanic may do on a magneto giving trouble. Its policy is to encourage magneto users to carry or send the magneto to a branch office, official distributor or an official service station.

There are factory branches at New York, Chicago, Detroit and San Francisco, and there are 22 official distributors, these being in the leading cities. In addition there are official service stations in the United States, exclusive of the large representation over all the foreign lands. The number is being increased and it is the plan of the company to greatly enlarge its service policies to prevent it to service its product universally and in a minimum of time.

What the Mechanic May Do

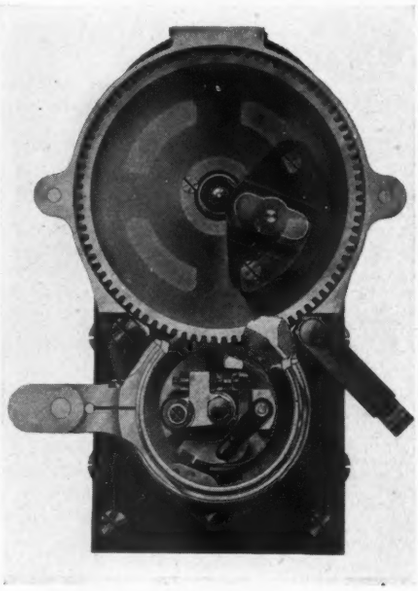
The following are the steps that may be taken by those other than factory-trained mechanics for locating ignition troubles, cleaning, adjusting, etc., the Bosch DU4 and ZR4 magnetos which are of the high-tension type. The directions are those recommended by the factory but do not include much work that is done by its service stations. If after completing the work outlined herein the magneto still fails to function satisfactorily, carry or send it to the nearest service station. DO NOT ATTEMPT TO DISASSEMBLE THE MAGNETO FOR REMOVING THE SCREWS FROM END PLATES OR MAGNETS VOIDS THE GUARANTEE.



The Bosch DU4 Magneto and Showing Interrupter Cover Spring, Grounding Terminal and Screws Retaining Distributor Plate.

Cause of Erratic Operation

The truck operator may complain that the engine misses when throttled down or at a low speed. Assuming that the mixture has not been changed and the erratic operation is not due to mechanical trouble, **examine the spark plugs and gage their gaps.** While the distance of the gap or space between the electrodes varies according to the engine, generally the gap should not be over 1/50 in. Too wide a gap, generally due to the burning action of the current on the electrodes, increases electrical resistance, causing missing and trouble at low speeds. It is, therefore, advised that the gap be gaged and if too large corrected. Measurement of the gap should be made from time to time, and the plugs should be cleaned and inspected.



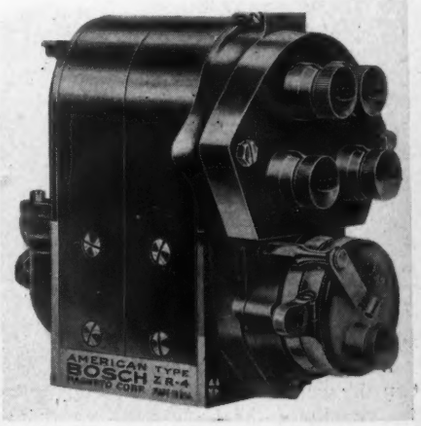
Phantom View of Distributor Brush and Holder, Metal Inserts, Etc.
The interrupter is shown just making contact with a cam when points are supposed to begin to break contact

Misfiring at all speeds and with the plugs and cables in good condition is indicative of trouble with the magneto, but it is suggested that before the instrument is examined that the wire be disconnected from the grounding terminal on the cover of the interrupter housing. If the engine operates satisfactorily with this wire displaced, but stops or is erratic in its operation with the wire replaced, examine the switch and the grounding wire. The switch may be at fault and it is possible that the grounding wire may be sufficiently chafed to establish a short or a ground. Also if when the ground wire has been replaced with a new one, the strands of wire were not carefully soldered to the terminal, or no terminal used, one of these strands may vibrate when the truck is operating over a rough road making contact with metal, thus causing temporary short circuiting.

Assume that none of the above conditions exist and that the magneto fails to function properly. If the instrument has been run for some time it is best to remove it from the engine for should the truck dealer's mechanic fail to correct the fault it will have to be sent to a service station. Before removing the magneto from the engine it is advisable to observe the wiring order; that is, how the spark plugs are connected or wired to the terminals on the distributor plate. If not familiar with wiring magnetos and firing order of engines, tag the cables before removing them from the terminals and tag the terminals with the same number. In other words, place a tag marked 1 on the cable leading to the spark plug in the No. 1 cylinder and another tag marked 1 on the terminal of the distributor plate to which wire is attached.

Cleaning and Adjusting

Remove magneto from engine and leave driven section of coupling on magneto shaft or if the Bosch impulse coupling be attached do not remove it. Place magneto on bench and thoroughly **clean exterior and wipe dry.** DO NOT FLOOD THE EXTERIOR WITH GASOLINE OR DIP IN ANY CLEANING FLUID. Place on clean section of bench. Remove the interrupter housing first. This is accomplished by slipping the spring holding it in place to one side. **Remove interrupter housing** and wipe



The Bosch ZR4 Magneto Differing From the DU4 in That Collector Brush Holder is Enclosed in Waterproof Holder.

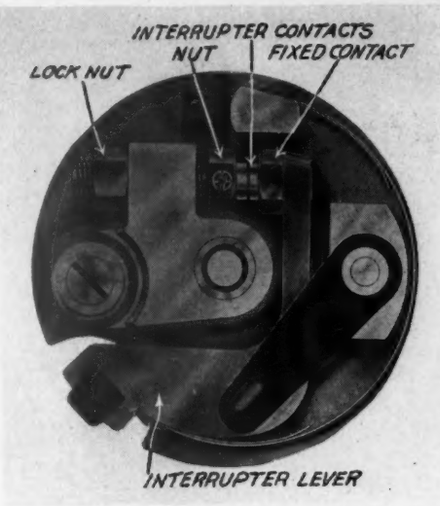
clean with soft cloth moistened with gasoline and wipe dry. Rotate armature shaft in the direction of the arrow on oil cover **until interrupter lever rests on one of the steel cams,** or as shown in accompanying illustration.

Loosen and remove the two distributor plate fastening screws which have a plain and a lock washer on each. **Remove distributor plate.** DO NOT REMOVE DISTRIBUTOR PLATE WITH DISTRIBUTOR BRUSH AT BOTTOM. The brush should preferably be at the top to avoid the possibility of damage to it. The location of the brush can be easily determined by tilting the distributor plate forward and slightly.

Clean the interior of the distributor plate with a soft cloth, one free from lint, dipped in gasoline. Just moisten the cloth. Do not flood it. Wipe distributor dry and place to one side. Examine the metal segments in the distributor plate and if these be burned or rough send the plate to the nearest factory appointed service station and have the surfaces trued and smoothed up. The rough or burnt condition is due to improper timing of the instrument and is generally caused by one trying to improve on the factory timing (engine). **Examine the carbon brush** in the holder of the distributor arm and see that it moves freely. Do not attempt to improve the tension of the spring else trouble will result.

Cleaning the Interrupter

Assume that the contact points of the interrupter are dirty and pitted, a condition brought about by the use of oil which never should be used in the interrupter housing. **Remove the interrupter housing.** This will afford ready access to the contact points. **Separate contact points** by pressing interrupter lever towards the center of interrupter mechanism **and insert** a fine, flat jeweler's file. **Release pressure on lever,** allowing contacts to grip file, and **move file back and forth** taking care to keep file in the same plane as the points. Make a few strokes then remove the file and note if pits are removed and contacts meet squarely. DO NOT EXERT PRESSURE ON THE FILE OR REMOVE TOO MUCH OF THE METAL. If the points are not filed true or they do not meet squarely, trouble will result. If the truck driver has attempted to clean the contacts and has removed too much of the metal and the points do not meet squarely, new ones will have to be fitted. This is a factory job or one for an officially appointed service station for the new screw (long member and carrying contact), is made slightly larger than the old or original one so that a special tool is required to fit the screw. This tool is only supplied the factory appointed service stations, branches or distributors. Any attempt to fit a new screw with contact is not practical for reasons that will not interest the layman. If new contacts are needed, displace the interrupter as a unit. To do this use the closed end of the wrench supplied with each magneto, which tool includes an open end wrench for the lock contact screw, gage for gap of contacts and a screw driver. Place wrench on the hexagon headed interrupter fastening screw, and holding the armature shaft by the coupling to prevent shaft turning, turn wrench to the left. The screw has a right hand thread. **Remove interrupter screw and interrupter as a unit.** If the interrupter sticks place the blade of a small screw driver between interrupter and magneto, one on either side, and pry gently.



The Interrupter With Parts Lettered

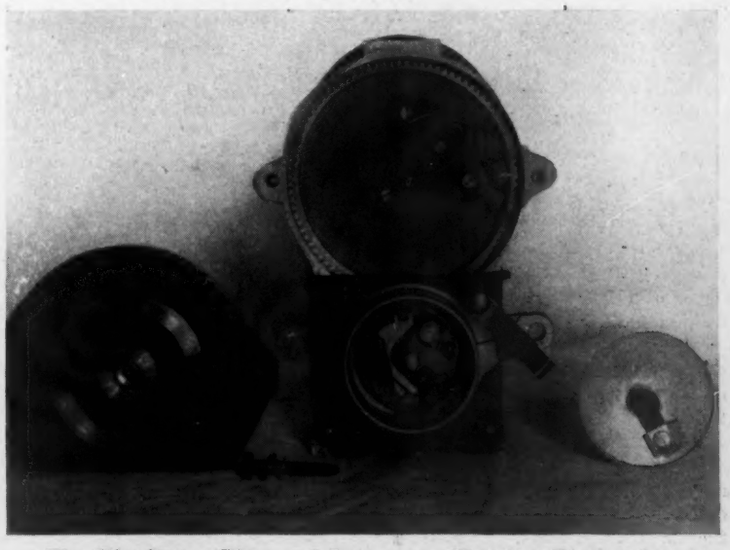
Assuming that the contacts have been cleaned properly and meet squarely, the next step is to **clean the interrupter.** Use a soft camel's hair brush dipped in gasoline or a soft cloth moistened with the fluid. Use can be made of compressed air for removing any foreign substances. Clean thoroughly and wipe dry. **Clean the interrupter housing. Replace the interrupter housing.**

Replacing Interrupter

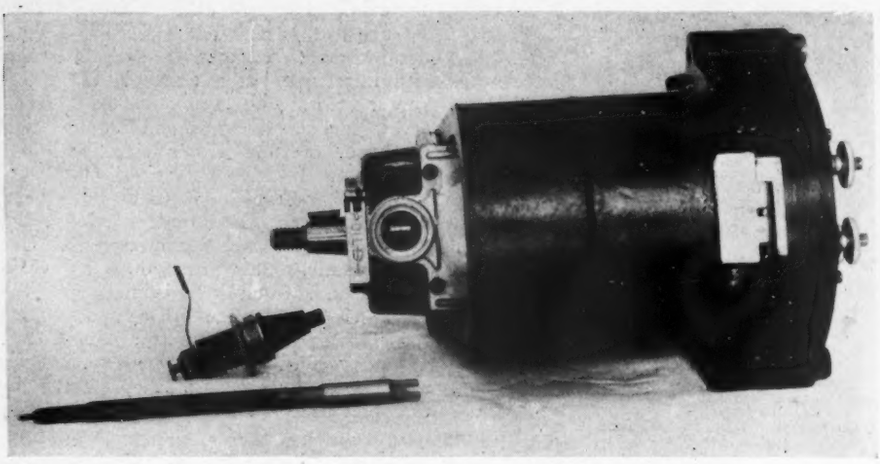
In replacing the interrupter CARE MUST BE TAKEN TO SEE THAT KEY OF INTERRUPTER MESHES WITH KEYWAY IN ARMATURE SHAFT. There is a keyway cut in the armature shaft and a small key formed in the interrupter disk. These are shown in an accompanying illustration, and their assembly must be carefully made. Start the key or interrupter on shaft in keyway of latter and push forward gently, but do not use force. The interrupter will slide on fairly easy. **Replace interrupter and interrupter screw,** setting up latter fairly snug.

Rotate armature shaft until interrupter lever rests on lower cam, when the contacts should be separated. Attached to wrench is a thin strip of metal, a gage which is used to measure the distance between the contacts. The thickness of this gage is 0.4 millimeter or about 1/64 in. NEVER USE OTHER THAN THE WRENCH GAGE in measuring the gap. **Insert gage between contacts.** If the gap be correct, the gage should be a feel fit; the contacts should slightly grip the gage. **If the gap be too large,** which will probably be the case after filling the contacts, it must be decreased. Use open end of wrench and **loosen lock nut of the long contact screw** by turning it to the left. It is a right-hand thread. Turn contact

To Remove Interrupter Attach Wrench as Shown and Turn Interrupter Screw to Left. The Armature Shaft Must be Held When Removing or Replacing the Screw



The Distributor Plate and Interrupter Housing Displaced and Showing Interrupter Lever on Cam and Location of Distributor Brush When Distributor Plate Can be Safely Removed.



Showing the Conducting Bar and Brush Holder Displaced From Magneto and Magneto on Side to Show Collector Ring

screw to the right to decrease the gap and to the left to increase it. During the adjustment be sure that interrupter lever is on center of the cam of housing. Turn contact screw until correct gap is secured, then **tighten lock nut.**. Try the gage a second time, as it may be that the adjustment may be disturbed in tightening the lock nut. Rotate armature shaft several times and note if interrupter lever moves freely, and, it is suggested, use gage again. This may appear unnecessary, but it is pointed out that the efficiency of a magneto depends largely upon the contacts meeting squarely, and the proper gap. Much of the reported magneto trouble is due to dirty contacts and their improper adjustment. When properly cleaned and adjusted they should require no attention for a considerable period provided oil be kept from the breaker mechanism.

Removing Collector Brush

If, after completing the work described and the results are not satisfactory, examination may be made of the collector, which is located at the rear of the magneto at the driving end. The brush is in a holder and the former makes contact with a ring on the armature. The high-tension current passes through the brush to a conducting bar in contact with the brush holder, to a metal contact in the center of the distributor plate.

To remove collector brush holder grasp conducting rod at brush holder end and push forward or towards distributor end of magneto. The rod is slotted and the slot end slips over stud of collector brush holder. The slotted end will slide forward on the conducting rod. Slide back slotted end until it clears the head of brush holder, and **remove conducting rod. Slip spring** attached to holder and resting on safety spark-gap cover (porcelain) **to one side and lift off cover. Loosen round knurled-holding nut** securing collector brush holder **and remove nut. Lift out brush holder with brush.**. Take a piece of soft cloth, free from lint, and slightly moisten it with gasoline. Place the cloth against the collector ring and turn shaft. This will **clean the collector ring** and remove any carbon, dust, etc. Examine brush and if broken replace with a new one. The brush should move freely in holder, but do not attempt to improve the tension. If in doubt as to condition of brush, submit it to service station or replace with a new one. **Replace brush holder, knurled nut, holding spring and conducting bar.**

Lubrication vs. Lubrication

There are but two places to be lubricated on Bosch magnetos. One is at the driving or rear-end and the other on top of the gear housing and in back of the distributor plate. Both are marked oil and are hinged. A few drops of high-grade LIGHT MACHINE OIL in each hole is sufficient for 500 mi. operation of the truck. NO OTHER PLACE ON THE MAGNETO REQUIRES ANY LUBRICATION. As a matter of fact, more trouble develops through too much lubrication than ot enough, and because some truck drivers use ordinary cylinder oil.

If after completing the work outlined and the magneto fails to deliver a proper spark, it should be sent to the nearest factory branch, distributor or service station. A list of these stations will be supplied the truck dealer on request. Dealers in ordering service parts should give the type and number of magneto, catalogue number and description of the part, if possible. The type and number of the instrument will be found on left-hand side of the base plate when facing the distributor plate end.

The Pirate Part Problem

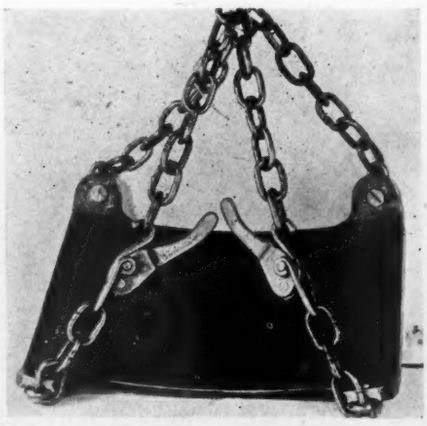
Dealers are cautioned against the use of substitute parts for Bosch magnetos. The company states that imitation parts are being marketed and that their use is responsible for trouble with the magnetos. Parts should be ordered either from the factory branches or service stations to insure satisfactory service of the magneto. The American Bosch Magneto Corporation has adopted a policy that should do much to protect its products and at the same time the trade. It consists of stamping each part with the copyrighted trademark of the company. In the near future every genuine Bosch part will bear the mark.

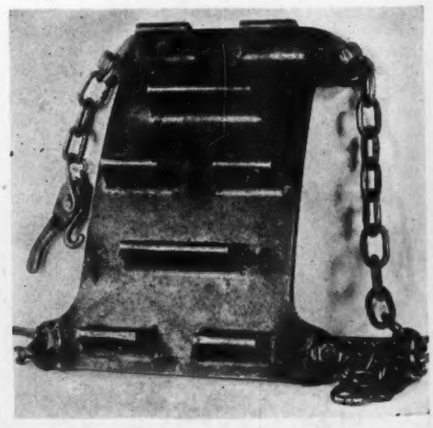
Chamber of Commerce Issues Bulletin Containing Cost System Advice

In a bulletin just issued under the title, "What a Cost System Should do for You," the Fabricated Production Department of the Chamber of Commerce of the United States calls attention to the purpose and value of cost accounting.

This bulletin makes the statement that part of the work of the Fabricated Production Department will be to assist organizations in obtaining for the industries they represent cost systems as practicable and as simple as possible.

"We shall not either devise or install cost systems," is quoted, "but by co-operative study of each situation, aided by the contributed experience of trade organizations and expert knowledge of the subject, help those who are disposed to help themselves."





These Grips Placed on the Market by Hale Ayres, General Manager of the Mutual Trucking and Transportation Co., of Los Angeles, Who Originally Developed Them for Use on His Trucks in Negotiating the Bad Roads on California Detours

The Tracto Grip is of malleable iron, has lugs 1¼ in. high, and fastens to the wheel with chains and a self-locking device. Three are used on each rear wheel, and excellent results are attained in the soft and sandy going sometimes found where heavy trucks must go

Service Station and Repair Shop Appliances

Mueller Engine Lathe

The following descriptive outline is that of the 18-in. Standard type, heavy-duty Mueller engine lathe, manufactured by the Mueller Machine Tool Co., 2426-9 Colerain Avenue, Cincinnati, Ohio.

The headstock is of heavy construction, bolted to the bed. The cone has three steps, 9½, 11 3/16 and 13 5/32 in. diam. for 3½-in. double belt, thus providing large belt contact and an abundance of power. The head cone is locked to or released from the face gear by a spring pull-pin. The tailstock is massive in its proportions, securely clamped to the bed. It is set off center as is the headstock. The slip type double back-gears change to different speeds by a lever conveniently placed on front of the machine. The back gear ratio is 3½ and 10½ to 1.

The spindle, which is made of high carbon crucible steel, has a No. 4 Morse taper and a 1 9/16 in. hole its entire length. Spindle boxes are made of anti-friction phosphor bronze. The thrust collar is of hardened and ground steel. End motion is taken up by a nut at end of spindle. Spindle is provided with means for any necessary adjustment. Eighteen spindle speeds, ranging in geometrical progression from 13 to 300.

Forty-five changes of thread, ranging from 2 to 60, including 11½-in. pipe threads can be cut. The feeds are positively geared and are three times threads. The bed has a deep vertical depth and is firmly braced its entire length with heavy cross girths. The rear bearing is flat. The machine cut-steel rack is in one piece, fastened from the front of the bed.

The carriage has exceptionally long bearings on the V's its entire length; has cross V 8¼ in. wide, with an extra amount of metal in the cross bridge, and is securely gibbed to the bed. It has an adjustable taper gib the full length of its bearing against the rear side of the bed. A long shear wiper and oiler is fastened to each end of the carriage bearings on the shear. The apron, which is tongued and grooved and securely bolted to the carriage, is a rectangular box, in which all the bearings for the gears and screws are cast integral with the bearing itself. All gears have bearings on both sides. The feeds are arranged so that only one feed can be in operation at a time. The lead screw is 1 9/16 in. diam. and 4-P thread, and is rotated only when screw cutting. All lead and feed screws are cut from a master screw. The compound rest has a good appearance. The upper slide is bolted to the swivel base.

This lathe has a special provision for oiling every bearing of this lathe. The countershaft has double-friction pulleys, 14 in. diam. for 5-in. belt. Speed is 175 and 210 r.p.m. All gears in quick-change gear box are of steel and teeth chamfered. The equipment consists of two face plates for large and small stock, compound and steady rests, countershaft and necessary wrenches. It can be equipped at an additional cost with a motor drive, longer bed, taper attachment, and automatic stop for carriage.

Specifications: Swings over ways, 18⅝ in.; swings over carriage, 13½ in.; standard length of bed, 6 ft. 3¼ in.; turns between centers, 2 ft. 4½ in.; size of tools; ¾ in. x 1½ in.; length of headstock on shears, 26⅛ in.; diameter and length of front spindle bearings, 3½ x 4 7/16 in.; diameter and length of rear spindle bearing, 2 5/16 in. x 3⅛ in.; diameter of spindle nose, 2⅝ in.; length of tailstock on shears, 12½ in.; length of carriage on shears, 27 in.; height of carriage, 5⅜ in.; depth of bed, 16⅞ in.; net weight, 3200 lb.; each additional two feet of bed, 200 lb.

Rylander Rack

The Rylander Rack, manufactured by J. Emory Rylander, Americus, Ga., occupies little space, but can capably retain a large amount of Ford parts. It is a fixture that should be of particular interest to the Ford Service Station. It can be used satisfactorily in a stock room or a show room.

Davis Cabinet Lathes

A new lathe of rather unique design that has a rigid bed is being produced by the Davis Machine Tool Co., Inc., Rochester, N. Y. This lathe is known as the Davis cabinet lathe. The bed is a 6-ft. one piece casting, and the extremities of which slope toward the center make for a single cabinet lathe, measuring 13 x 24 in. The sides also taper outward. The height from the top of the base to the ways is 17 in. The cabinet base has a large door and ledges to support shelves are within the compartment.

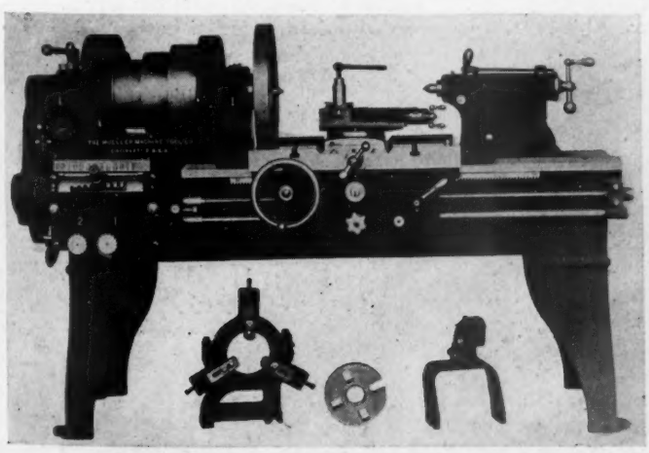
The headstock of this lathe is a rigid modern box construction. The spindle is a crucible steel forging, accurately ground and rests in bronze bearings. Drive is through a three-step cone and there are double-back gears controlled by the lever shown on the headstock. This provides 18 spindle speeds ranging from 23 to 500 and with a bevel double-speed countershaft, running at 290 to 350.

The quick change gear box in conjunction with the feed lever, on the front side of the headstock, allows a change of thread or feed ranging from 4 to 40 threads per inch, in thirty steps.

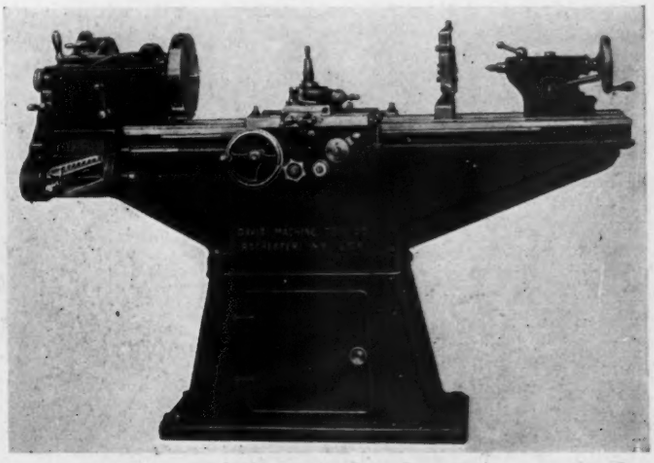
The tailstock is offset to allow the compound rest to swivel parallel with the bed. The spindle is steel and has a 5¼-in. travel. Longitudinal and cross feeds are operated from the front of the apron. The compound rest has a large bearing and a taper gib top and bottom. The base is graduated to swivel 90 deg. either way.

The countershaft has double section pulleys and the apron a rear support for the rack and pinion stud.

Standard equipment includes large and small face plates, compound rest, steady rest, thread indicator, countershaft and wrenches. When specified and at extra cost, there will be furnished a taper attachment, draw-in chuck attachment, metric transposing gears and a motor drive.



The Standard-Type Heavy-Duty Mueller Engine Lathe
It has forty-five changes of thread, and but one feed can be operated at a time



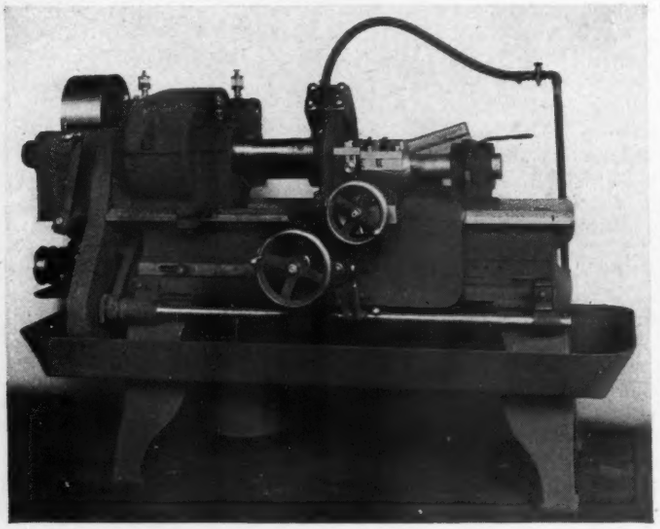
This Davis Lathe, Originally Designed for Mounting on Motor Trucks, Was Later Brought Out for Application of Belt Drive

Specifications

Length of bed	6 ft.
Swings over carriage	7½ in.
Swings over ways	13¼ in.
Takes between centers	42 in.
Sized tool ordinarly used	½ x 1 in.
Capacity of center rest	3½ in.
Ratio of back gears	8½ in.
Cone diameters	6¾, 5 13-16, 4⅝ in.
Width of belt	2 in.
Diameter tail spindle	1 5-16 in.
Cuts threads	4 to 40
Hole in spindle	1 1-16 in.
Front bearing	1¾ x 2¾ in.
Back Bearing	1½ x 1⅞ in.
Size pulleys on countershaft	8 x 3¼ in.
Speed of countershaft	290 and 350 r.p.m.
Net weight	1481 lbs.
Gross weight boxed for export	2180 lbs.
Size of box for export	31 x 55 x 80 in.
Floor space	28 x 76 in.

Reed-Prentice Automatic Lathe

The Reed-Prentice automatic lathe, manufactured by the Reed-Prentice Co., 53 Franklin St., Boston, Mass., is the advanced development of the Multiple tool engine lathe incorporating an additional labor-saving device. It is especially adapted for straight, taper and form turning; straight and form boring; straight and bevel facing, and recessing.



Reed - Prentice Automatic Lathes Can be Obtained With or Without Motor Mounted on the Headstock

The headstock is built in three general types: The direct pulley drive, the single gear-reduction and double gear reduction. The friction headstock is used where it is possible to drive direct to the spindle by belt. The single gear reduction headstock is used where it is not practical to use direct belt drive and where considerable more power is consumed. The double gear reduction headstock is used where excessive power is necessary and where the diameters are of such proportion that the proper cutting speed is obtained by slower spindle speeds. The spindles in all three types of headstock are of low carbon steel.

The machine may be equipped with the type of tailstock best adapted to the class of work to be performed. The hand-wheel tailstock is employed when the work is within certain limits. The cam and hand lever tailstock is used where extra long spindle adjustment is necessary. The spring tailstock is best adapted to lathes performing small work, on which it is not necessary to stop the head spindle.

The lathe has been equipped with the single-feed principle, which permits a simple check on daily production. The lathe is shipped with proper feed gears, although if it becomes necessary to change the feed; other gears may be introduced. Unless otherwise specified, the lathe is regularly shipped with a feed of .015 in. per revolution of the spindle. Complicated parts have been eliminated from the apron. Power is received from the feed rod and delivered to the rack pinion gear through an internal friction clutch in the worm-gear. The rack pinion and the rack with which it meshes are hardened to resist the severe service. When power cross feed is required additional gears are added.

Long bearings carefully scraped to the bed "V's" and properly protected by chip guards prolongs the life. Special designs of carriages are furnished at slight additional cost. The use of a magazine tool holder is recommended.

The back arm, a patented feature, is dependent in its action upon the traverse of the carriage. Its function is that of squaring shoulders, grooving and champhering, or in fact, any operation performed by the cross or angle feed of the ordinary lathe tool blocks. The back arm blocks are mounted on a very rigid arm, which is clamped to a large shaft or bar located at the rear, this bar being supported in bearings cast integral with the head and tailstocks. A roll carrier extending from the bar engages an adjustable cam surface, carried by a bracket, which is bolted to the rear of the carriage, so that during the travel of the carriage the back arm tool block is fed radially into the work and completes its operation simultaneously with the front tools in the carriage.

A tight and loose pulley countershaft is regularly furnished. If, however, conditions necessitate the use of two speeds, a double friction pulley countershaft can be furnished at a slight additional cost.

The top of the bed has been designed somewhat different from that of the usual engine lathe, in that it has a drop-vee for the inside ways.

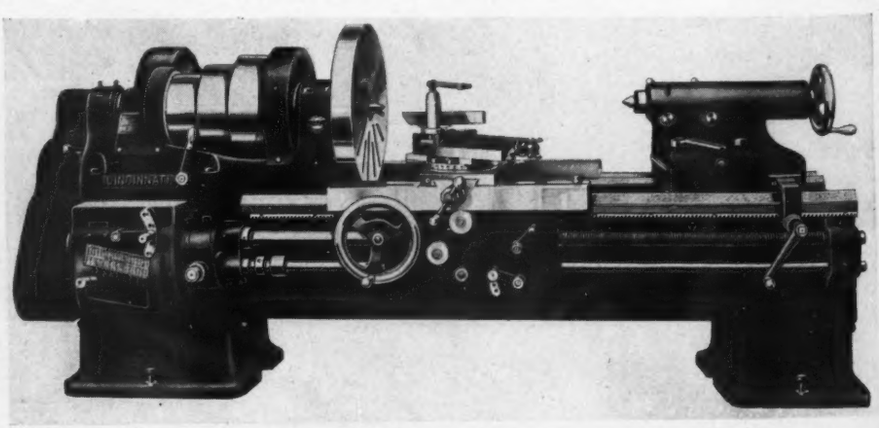
The pressed steel oil pan with extra large reservoir provides ample room for chips and cutting compound. This type of steel oil pan also eliminates all possibility of breakage.

Specifications

Height to Spindle Center	42
Height Over All Friction Pulley	..
Height Over All—Single Gear Reduction	54
Height Over All,Double Gear Reduction	59
Width Between Bolts	23
Width Over Foot	28
Length Between Bolts	55⅜
Length Over Foot	60⅝
Distance From Foot to Extreme End	17
Distance From Foot to End of Pan	5¼
Distance From Foot to End of Pan	10⅛
Distance From C. L. to C. F. Handwheel	24⅝
Length of Head	23¾
Length of Tail Handwheel	16¾
Length of Tail Cam Lever	16½
Handwheel Tail	23½
Cam-Lever Tail	23¾
End of Bed to End of Guard	6
End of Bed to End of Handwheel Tail	5
End of Bed to End of Cam Lever Tail	8
Spindle Center to Flat of Bed	7⅞
Spindle Center to Top of Plain Block	2¼
Swing by Back Arm	4⅛
Swing Over Carriage Horns	8¼
Swing Over V'S	8¼
Swing Over Carriage Dovetail	4½
Diameter of Back Arm Bar	3½
Gear Ratio in Head—Single Reduction Head	3-1
Gear Ratio in Head—Double Reduction Head	6-1
Net Weight Complete	3475 Lbs.
Boxed Weight Complete	4100 Lbs.
Cubic Feet Machine	157

Severe-Duty Cincinnati Lathes

Owing to the heavy construction, as well as the correct proportioning of all details of the Cincinnati lathes, manufactured by the Cincinnati Lathe & Tool Co.,



The Cincinnati Cone-Type Lathe

This 28-in. lathe incorporates, in addition to many other features, a 3-step cone, double back gears, and with a handle in front of the headstock to shift these gears

Oakley, Cincinnati, O., accurate work is assured. Two styles of these lathes are supplied in sizes from 16-18-20-22-24-26-28-in., belt drive. It is regularly made with a 3-step cone, double back gears and handle in front of the headstock to shift these double back gears. Special equipment, consisting of a pan and pump, 3-step cone, friction double back gears, hexagon turret on bed, power feed, can also be had.

The beds are of semi-steel and strongly braced internally by numerous box section girths, feed gears, pinions, and gears are of steel. Each lathe is regularly furnished with double wall apron, chasing dial, automatic stop, cabinet leg, plain or compound rest, follow rest, large and small face plates, necessary wrenches, self-oiling friction countershaft, etc., completely ready for use. Any length of bed and the following attachments are supplied: Turrets on carriage or bed, oil pan and pump, taper attachment, relieving attachment, draw-in attachment, turret tool post, raising blocks, chucks, lathe tools, etc.

The headstock is made in four styles, all of which are rigid and well proportioned to absorb vibration. The spindle is of high carbon forged steel. The boxes are of bronze bearing metal made to a special analysis. The thrust bearing at rear end of spindle consists of a hardened tool steel collar for adjusting the wear The end thrust is taken against the front end of the back box.

The apron is bolted rigidly to the carriage, and is of box-type construction, which gives a double support to all shafts and studs mounted in it. Rack pinion is made of steel, well supported and close to the rack on bed, motion to it being transmitted by compound gearing. Longitudinal and cross friction feeds can be started, stopped or reversed while the lathe is running, but cannot be engaged when cutting screws. A thread-chasing dial is provided, which permits the carriage to be run back by hand and the thread to be picked up. There is also an automatic stop for throwing out the feeds. Carriages are gibbed both in front and at the back, having a bearing the entire length of the V's of the bed.

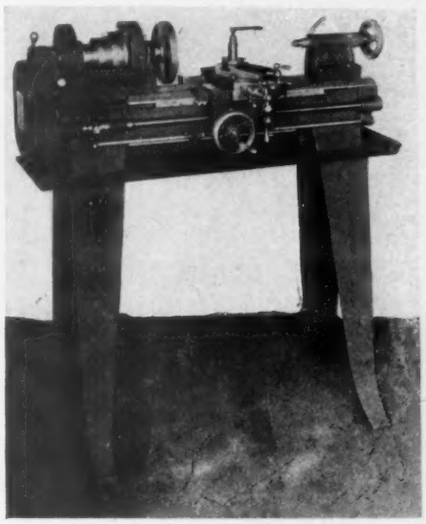
A reverse plate for cutting right- and left-hand threads is on the outside of the headstock, but is used only for reversing lead screw when cutting threads, and not for reversing feed. These machines have feed reverse in apron. All changes can be made while lathe is running under a heavy cut. The standard threads are made from one to another at once without duplicating or removing a gear, by simply operating two levers conveniently placed a few inches apart. It gives unlimited range. There are no delicate time-wasting adjustments. Every box assembled forms a complete unit, and is mounted on front of bed, permitting of easy access. Permanent alignment is insured by means of tongue and groove in bed.

The tailstock has a long bearing on the bed. It is of the offset type, allowing compound rest to be set in a plane parallel with bed. The spindle in it is large in diameter, well supported at front end and has a bronze nut for the screw. A clamping device is used to lock the spindle in any position.

The countershafts are furnished with double friction self-oiling clutch pulleys, run on bushes that hold enough oil for a month. The double-brace hangers are of pressed steel. Again, as many speeds may be obtained with two-speed countershaft covering a carefully selected range. In these countershafts, Hyatt or any other roller bearings are supplied as desired. These lathes, if set up and aligned properly, are guaranteed to bore and turn true to within .001 in.

F. M. C. Ball Bearing Engine Lathe

The F. M. C. 7-in. ball bearing engine lathe, produced by the Flather Mfg. Co., Inc., Nashua, N. H., is a standard back-geared engine lathe of unusual power considering its size. It is equally adaptable for toolroom and production work. This model lathe is made in two types, the



Floor Type F. M. C. Engine Lathe Capably Handles Numerous Operations

bench lathe, which has short legs and the floor lathe, which has long legs and a chip pan.

This machine has the cone pulley mounted so that the pull of the belt and thrust of the spindle are taken by ball bearings. The company points out that this construction has the following advantages: Permanent alignment of spindle, minimum friction losses, high spindle speeds on steady work, very slight vibrations and great accuracy.

The one-length bed gives 15 in. between centers. Taper attachments can be applied to either type at any time. Draw-in attachment can be furnished with collets up to ½ in. capacity. The headstock is full webbed with long bearings on bed. The back-gear ratio is 7:1. A 1¼-in. belt transmits power to the three steps cone pulley. The carriage and apron are well proportioned and heavily built. A feed stop is provided to disengage the feed clutch automatically at any pre-determined point. The lead screw is held by a middle bearing, on which the step nut acts, thereby leaving it free for expansion at the back end.

Specifications: Height of centers over bed, 4 in.; height of centers over cross-slide, 2½ in.; swing over bed, 8 in.; swing over cross-slide, 5 in.; length of bed, 36 in.; distance between centers, 15 in.; back gear ratio, 7:1; cone diameters, 5⅛ in., 3⅞ in., 2⅝ in.; thread cutting range, threads per inch, 3 to 72; cross-slide travel, 4 in.; compound rest travel, 1⅞ in.; hole through spindle, ¾ in.; capacity of collet, ½ in.; taper attachment turns, 2½ in. per ft., 12 in. long; speed of countershaft, 300 to 325 r.p.m.; lead screw, 13/16 in. in diameter, 10-thread, Acme; bench lathe, net weight, 300 lb.; floor lathes, net weight, 400 lb.; bench lathe, shipping weight, 350 lb.; floor lathe, shipping weight, 500 lb.

Ray Battery Test

Considerable interest is attached to the recent test made upon a Ray battery, a product of the Ray Battery Company of Detroit, and two other well-known makes in the presence of two responsible engineers. The three batteries were of the 6-volt, 11-plate type and showed uniform voltage at the start of the test.

Each battery was put on dead short circuit under exactly similar conditions. Each drew approximately 250 amperes at the outset. The first battery tested lost its voltage in one cell in eight minutes and thirty-five seconds. The second battery registered negative voltage in one of its cells in nine minutes time.

On the same instruments and in the exact same manner of testing the Ray kept functioning for twenty-five minutes, at which time the test was discontinued. The final test showed all cells to be still active, registering the following voltages, .25, .35, .50.

At the conclusion of the test each battery was torn down. The Ray plates retained practically their original state, showing practically no sulphation of an injurious nature and no sign of buckling. The record seems to bear out the claims of the makers that the Ray plates, known as the Lavier Formula plates are unusual in their composition.

These plates are claimed to be so hard as to preclude injurious sulphation, washing down or buckling and yet to have such a high degree of porosity as to be unusually accurate in taking in electricity and throwing it out again for starting and lighting and ignition purposes.

The maker's confidence in these plates appears to find expression in a two-year unconditional guarantee in which they agree to replace without question, during the period of the guarantee agreement, any of their batteries which go wrong. They withhold two restrictions, namely, freezing and wreckage of the battery by accident.

The maker states that, because of the unusually high degree of porosity of the plates the time of manufacturing is so reduced as to materially reduce the price. The prices range from $29 to $39 retail

Several Interesting Service Station Items

Among the interesting equipment in the lines of the Service Station Equipment Corp., 3701 S. Ashland Ave., Chicago, Ill., are a motor truck or stand, Model M 24; a coil unit and magneto test stand; a sleeve puller; an axle stand and a coil unit adjusting tool set. The exclusive distributor of these products is the Fairbanks Co., New York City.

The quick-action motor truck M 24 is constructed to firmly hold a Ford engine for assembling or disassembling. It will also hold an engine with broken crank arms. Its weight is 27 lb.

The Ford coil unit and magneto test stand M 35, for testing and facilitating the adjustment of coil units and magnetos, consists of a 2-ampere Model 156 ammeter, a Ford magneto provided with a crank and rotating spark gap and a device for clamping the coil unit in place and at the same time making the necessary electrical connections. For this test the magneto ammeter and primary of the coil unit are connected in series. The coil secondary is connected across the rotary spark gap. When the magneto is revolved, the ammeter shows the primary current flowing. The number of sparks produced by the passages of the magnetic poles in front of the coils per 1-16 of a revolution may be counted by watching the rotating spark gap as it passes over the graduated dial. The dial is graduated into 16 parts, the magneto having 16 poles. One good spark should pass for each 1-16 revolution of the crank and the current indicated by the ammeter should be 1.2 and 1.4 amperes. The function of the impedance coil, through which the current passes when making tests, is to cause the indications of the instrument to be substantially independent of the engine speed. Unit and stand weigh 115 lb.

The Ford truck sleeve puller M 52 is designed to remove the roller bearing sleeves from the Ford truck rear-axle housing. It can be used for both ends of the housing, and its use saves considerable time and prevents injury to the sleeve. Its combination feature makes it possible to use when the shaft is either in or out of the housing. It weighs 10 lb. The combination sleeve puller M 41 is similar in construction but weighs only 7¼ lb.

The rear axle running-in and test stand, Model M 30, is most useful for such work as running-in and testing a rear axle after overhauling. It can be used with the American Universal, American burning-in or American running-in stands. It weighs 150 lb.

The coil unit adjusting tool set, M 45, is especially designed for adjusting the coil unit of the Ford engine and consists of three special wrenches, a small mallet, a small screw-driver, a small rat-tail file and a thickness gauge. The set is packed in a smooth finished box, and is sold only by the set.

Improved Valve Lifters

Various changes have been made by the Loomis-Beardsley Mfg. Co., 1112 Mt. Vernon Ave., Columbus, Ohio, on its valve lifter. The new universal model operates

Improved Loomis-Beardsley Valve Lifter

on the same principle as the old one, but is made heavier. The top of the lifter is made of hollow steel tubing, and the bottom of ⅛-in. cold rolled steel, making it stronger and better. The new Ford model is made of hollow steel tubing, while the foot is made of heavier steel, greatly strengthening it.

Jansen Burning-in Machine

Four models of burning-in machines are now being manufactured by Theo. W. Jansen, 739-741 21st St., Des Moines, Ia., namely: No. 1 combination gear head drive burning-in and running-in machine; No. 2 two-speed burning-in testing-out and running-in machine; No. 3 gear head burning-in machine; No. 4 direct drive burning-in machine. These machines are designed for use on Ford engines.

All of these models are extremely low in design which tend to make them solid, eliminating to a great degree vibration.

Particular attention is called to the revolving head of the Jansen burning-in, testing-out and running-in machines, by means of which the simple turning of a handle moves the engine to any position desired by the operator; in fact, it can be turned completely over while running. The lower part of the base is divided into compartments which enables the workman to keep the parts of each individual cylinder separate.

The entire machine is so designed that a very small amount of power is needed to operate it. One or more bearings can be burnt-in at a time and the amount of power used is governed by the number of bearings being worked upon. Another important feature is that the machine is built on the interchangeable plan which permits the replacing of any broken part or parts without throwing the entire machine out of commission for an indefinite length of time. This machine is also equipped with a try-out lever so that the stiffness of the motor and bearings can be determined at any time.

The entire machine is only 5 ft. 9 in. wide and 2 ft. high. The pulley is 10 in. in. diam. with an 8-in. face and a speed of from 600 to 800 r.p.m. It is equipped with an adjustable disc clutch, which has ample surface for the work required. This machine sells for $250.

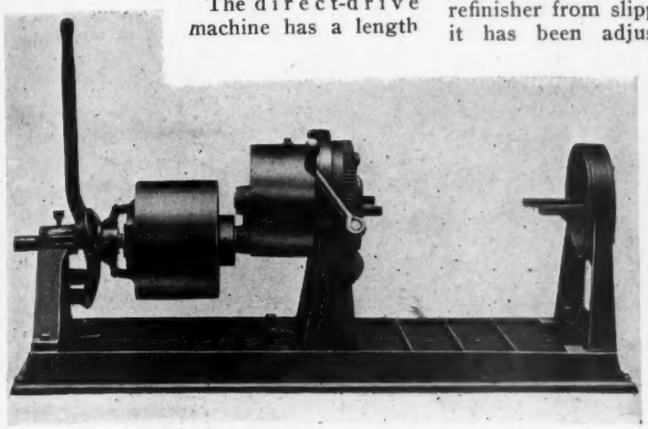
The two-speed machine has a reduction gear head for burning-in and a direct pull

Repair Equipment for Ford Service Station

The right end illustration shows the American Quick-Action Motor Chuck used to hold a Ford engine firmly in place while repairing. This stand will hold an engine, even if the crankcase arms are broken. The device weighs 27 lbs. Illustrations at the upper left show the Ford Chuck Sleeve Puller and the Combination Sleeve Puller. The lower left illustration is of the Rear Axle Running-in and Test Stand. The lower center illustration shows the Coil Unit and Magneto Test Stand which are used to test and to facilitate the adjustment of the coil units and magneto.

for running-in and testing-out on the opposite end. The bearings can be burnt-in on one end and another motor can be running-in on the opposite end, performing both operations at the same time. It has a revolving head, adjustable disc clutch and a try-out lever and is especially designed for shops where a large amount of this kind of work is being done. Its dimensions are: Length, 8 ft. 6 in.; width, 19 in.; height, 24 in., and is quoted at $340.

The direct-drive machine has a length of 4½ ft., width of 21 in. and height of 28 in., and is priced at $185. The diameter of the pulley is 1 15-16 in. It has the disc clutch and base compartments for keeping each cylinder's parts separate.



Jansen Burning-in Machine

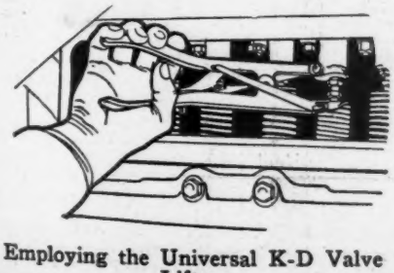
Designed especially for burning-in Ford engines. The revolving head feature permits the engine to occupy any position during the burning-in process.

K-D Parallel Jaw Valve Lifter

The parallel opening and closing of the jaws of the K-D parallel jaw valve lifter is stated to eliminate all possibility of the washer, or spring binding on the stem and raising the valve. It is manufactured by the K-D Mfg. Co., and distributed by the Gasco Mfg. Co., 117-19 East King St., Lancaster, Pa.

The locking device is entirely within the handles, and stays locked, allowing the operator the unhampered use of both hands to extract the key. For removing and replacing valves this device is equally efficient. Its reversible construction makes it universal throughout.

Two extra jaws of different sizes are furnished with each tool, all being interchangeable. The change is made by removing the fulcrum pin, one size jaw can be removed and another size attached. Each jaw has a different size opening, and the combination of these sizes makes this tool adaptable to practically all sizes and types of engines. It is made of all pressed steel and sells at $2.25.



Employing the Universal K-D Valve Lifter

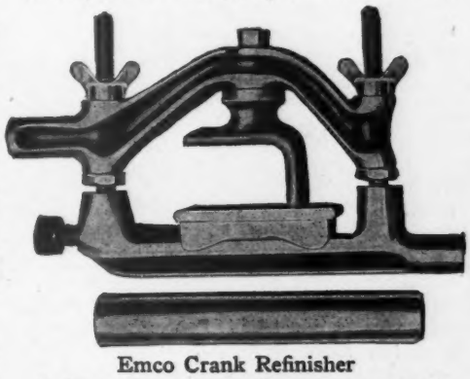
Taber Crankshaft Refinisher

The manufacturer of this tool, the Emco Mfg. Co., Inc., Binghamton, N. Y., states that with this tool it is possible to true up bearings to one-half thousandth of an inch.

Attention is called to two features incorporated in its construction. First, there are the wing nuts on the frame stud, that screw down against the rigid frame of the bronze L block. These hold the bearing securely against the file and prevent the refinisher from slipping out of place after it has been adjusted to the bearing. Second, to safeguard against flat places being left in the refinished bearing, is a provision in which bow bar is made rigid by screwing two jam nuts tight against it.

This crankshaft refinisher, although strongly constructed, is not unwieldy to handle, as it is only 8¾ in. long, 5½ in. high and weighs 3¾ lbs.

Shaft bearings, unevenly worn, flat or so scored that minute grooves are plainly visible, can be accurately finished so that the shaft revolves in an unbroken film of oil. This device is constructed of steel, bronze and iron, which combine in attaining strength, compactness, light weight and simplicity of operation.



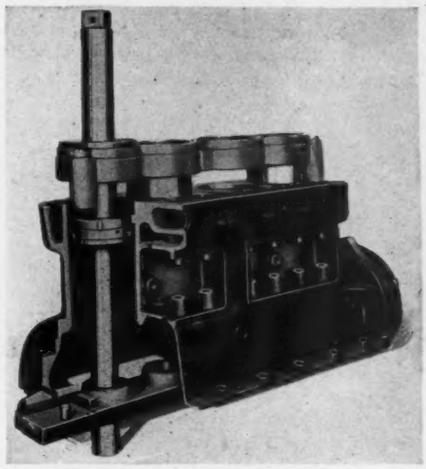
Emco Crank Refinisher

Appliance for truing up flat, uneven or scored crankshaft bearings

Champion Reboring Tool

The Champion reboring tool, recently announced by the Champion Mfg. Co., 2908-10 W. Fletcher St., Phila., Pa., consists of a top and bottom locating plate and a boring bar. The top plate is centered by means of two locating plugs and bolted down with three cylinder-head bolts. The method of locating the bottom plate insures positive alignment with crankshaft bearings and is held in position by two main-bearing bolts.

The boring bar is equipped with two cutter heads, one for the rough and one for the finish cut. Only one operation is necessary to rebore and finish a cylinder. This tool rebores a Ford Model T cylinder block, including the time for attaching, in less than thirty minutes when used on any power feed drill press, 20 in. or larger. It may also be used for the Fordson tractor. The complete equipment, including extra cutter head for Model T cylinders, is $200. The complete outfit, including extra cutter head, for Fordson cylinders, is $222. Prices f.o.b. Philadelphia.



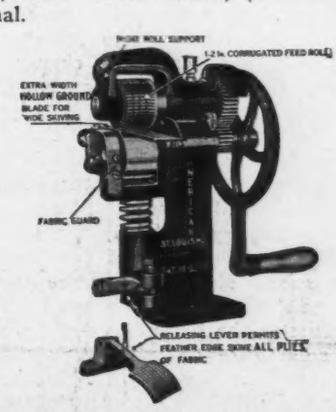
Champion Reboring Tool in Position

Showing the Champion Reboring Tool and its top and bottom locating plates

Improved Wide Blade Fabric Skiver

The Improved Wide Blade Fabric Skiver, manufactured by the American Shoe, Machinery & Tool Co., St. Louis, Mo., performs the work of skiving down the plies of pulled tire fabric for reliners and shoes, both efficiently and quickly. The R. T. Sales Co., Green Bay, Wisconsin, is the sole distributor.

This machine will skive two-ply reliners, and is adjustable to skive up to five-ply. The extra width hollow ground blade permits wide skiving, the roll support is rigid, the corrugated feed roll is 1½ in. wide, and the releasing lever permits feather edge skive of all plies of fabric. It sells at $27.50. Extra blades, $1 each additional.

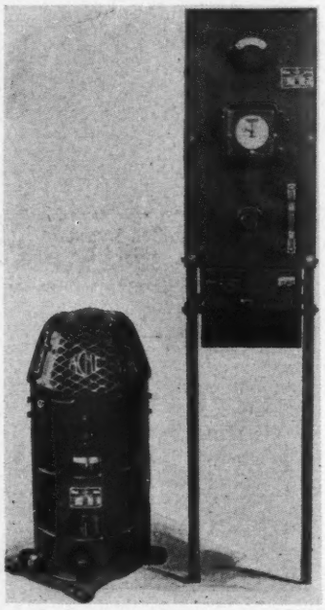

EXTRA WIDTH HOLLOW GROUND BLADE FOR WIDE SKIVING
FABRIC GUARD
RELEASING LEVER PERMITS FEATHER EDGE SKIVE ALL PLIES OF FABRIC

This Machine Skives Down the Plies of Pulled Tire Fabric

Acme Charger for Industrial Trucks

The Acme Electric & Mfg. Co., Cleveland, Ohio, manufacturers of various battery charging apparatus and motor generators, recently introduced a new charger to charge batteries of industrial trucks.

This charger, known as the Acme, and developed after an exhaustive study of the operating conditions of the modern industrial truck, is designed to charge the battery at the rate recommended by the battery manufacturer. This adaptability feature is said to eliminate much of the trouble incident to too high a charge rate, which will over-heat and ruin a battery, and too low a rate, which will starve it.



This Acme Outfit, Which Includes a Charger and Instrument Panel, Charges Batteries for Industrial Trucks.

The following important points are brought out by the manufacturer: Acme chargers automatically take care of a charging rate without the use of rheostats, thus giving highest efficiency; they give the tapering charge which prolongs the life of lead batteries; maintain a constant ampere-charging rate; and a safety control on the switch board insures protection to the operator. All high voltage parts are also enclosed.

To operate this automatic charger the ampere-hour meter is set to correspond to the truck meter and the charger is then started with a simple movement of the automatic switch handle. When the battery becomes fully charged the ampere-hour meter actuates a trip in the switch and motor is shut down; battery being disconnected at the same time.

The Acme charger takes up but a little more than a square foot of floor space. Its motor is of liberal capacity and built for heavy service. The generator is designed to suit the battery and the shaft is one solid piece of extra-heavy structure, rotating on over-size ball bearings. The dynamically balanced armature and rotor are mounted on one shaft. The commutator has a large radiating surface and maintains a low operating temperature. Cool operation is afforded by a Sirocco type fan which thoroughly ventilates the engine by drawing cool air through the windings. An automatic panel accompanies the charger. It is a rubber finished electrical slate mounted on an angle iron frame and contains the following equipment: volt-ammeter for indicating the battery charge rate and voltage, field rheostat for regulating the generator voltage, fuse for protecting the generator, ampere-hour meter for automatically controlling the charge; this meter also contains a dial which indicates the progress of the charge; and an automatic oil switch for controlling the motor and for disconnecting the battery on completion of charge.

Haskins Electric Buffing Equipment

The M-5 motor-driven buffing equipment, manufactured by the R. G. Haskins Co., 27 South Desplaines St., Chicago, Ill., is similar to the C-5, differing only in the fact that it's portable.

It consists of a ¼-hp. motor, 5 ft. of shafting, 3-speed countershaft (900, 1800, 3600 r.p.m.) spindle and scratch brush. Power to operate this equipment is taken direct from an electric light socket. The C-5 equipment consists of a bench stand with a flat pulley, 5 ft. of shafting, spindle and scratch brush. It is practical, economical and sturdy and can be driven from line shaft or motor. The type M-5 equipment, as illustrated, sells at $105 D.C. or $120 A.C.

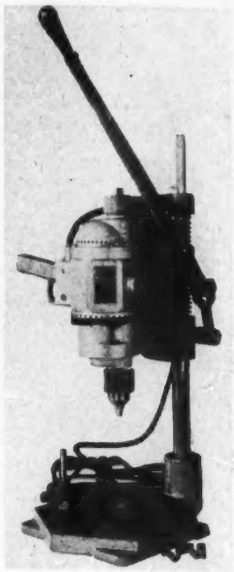
Haskins Tire Pumping Equipment

The accompanying illustration shows the Type M-5 motor-driven equipment which is similar to the C-5, but portable. It has a ¼-hp. motor, 5 ft. of shafting and a three-speed countershaft.

Black & Decker Bench Drilling Stand

The new bench drilling stand just put on the market by the Black & Decker Mfg. Co., Baltimore, Md., was designed especially for its portable electrical drills and takes the following size drills: ⅜ in., ½ in., 9/16 in., ⅝ in. and ⅞ in. This stand is exceptionally rigid, all parts being of unusually generous size. For instance, the vertical column is a solid steel shaft 1 7/16 in. diam. and the base, which has four holes for fastening stand to bench is secured by four ⅜-in. lag screws.

The bracket carrying drill can be raised or lowered on the vertical columns of the stand and can be secured in any desired position by means of split collar and clamping screw. The drill can be swung clear of the base, if desired, making it possible to use the bench for such work as applying ring gears to automobile axles, drilling in the ends of shafts, and other work too high to be drilled on the bench.



This Black & Decker Bench Drilling Stand Was Designed Especially for Black & Decker Portable Bench Drills

Both vertical and horizontal adjustment are secured by means of the clamping screw. An extra long feed lever gives a feed ratio of 6 to 1. If 100 lbs. pressure is applied to the handle the drill feeds under pressure of 600 lbs., permitting fast work with little effort.

In the base are six tapped holes to accommodate half-inch studs, for clamping work in place. One stud with nut and clamp is supplied with each stand. Following figures cover general dimensions:

Height (Bottom of base to top of vertical column)	30 in.
Vertical adjustment of drill	12 in.
Drilling Radius (Distance from center of drill bit to circumference of vertical column)	7 in.
Horizontal Adjustment of Drill (Complete Circle)	360°
Feed (Vertical travel of drill when operated by feed lever	4 in.
Net Weight	70 lb.
Shipping Weight	110 lb.
Shipping Dimensions	19.4 x 14 x 33 in.

The price of the bench drilling stand, complete with adapter block, but without portable electric drill, is $50.

Replacement Table. Corrected Monthly

Including Piston Ring Sizes, Carburetor Sizes, Brake Lining Sizes and Truck Frame Dimensions

Note: Under Carburetor Inlet Diameter will be found either the size of the main air intake or the gasoline fuel line

Name, Model, Tonnage and Year	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Acason R-1—1920	4	1/4	1	.....	11 1/2	3	1/4	2	11 1/2	3	1/4	2	112	34
Acason RB-1 1/2—1920	4	1/4	1	.....	11 1/2	3 1/2	1/4	2	11 1/2	3 1/2	1/4	2	112	34
Acason H-2 1/2—1920	3	1/4	1 1/4	.....	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	130	35
Acason L-3 1/2—1920	3	1/4	1 1/4	.....	16	3 3/4	1/4	2	16	3 3/4	1/4	2	163 3/4	35
Acason M-5—1920	3	1/4	1 1/4	.....	18	4 1/2	1/4	2	18	4 1/2	1/4	2	167 1/2	35
Ace, Series A1 1/2—1920	3	1/4	1 1/4	1 1/16	12	3 1/4	1/4	4	12	3 1/4	1/4	4	122 1/2	32
Ace, Series A2 1/2—1919-20	3	1/4	1 1/4	1 1/16	13 1/2	3 1/4	1/4	4	13 1/2	3 1/4	1/4	4	144 1/2	32
Ace 3	4	1/4	1 1/4	1 1/16	51	2 1/4	1/4	2	51	2 1/4	1/4	2	144	32
Acme B-1—1916-20	3	1/8	1	.....	12	3 1/4	1/4	4	12	3 1/4	1/4	4	110 3/8	34
Acme F-1 1/2—1919-20	3	1/8	1	.....	12	3 1/4	1/4	4	12	3 1/4	1/4	4	124 3/8	34
Acme A-2—1916-20	3	1/8	1 1/4	.....	13	3 1/2	1/4	4	13	3 1/2	1/4	4	135 1/2	34
Acme C-3 1/2—1917-20	3	1/8	1 1/4	.....	15 1/2	3 3/4	1/4	4	15 1/2	3 3/4	1/4	4	150 1/2	36
Acme E-5—1919-20	3	1/4	1 1/2	.....	18	4	1/4	4	18	4	1/4	4	160	37
All-American A-1	.....	.....	1 1/8	2	45	2 1/2	1/8	2	43 1/8	2 1/4	1/8	2	104	31
All-American-1 1/2	.....	.....	1 1/8	2	45	2 1/2	1/8	2	43 1/8	2 1/4	1/8	2	116 7/8	34
All-American-2 1/2	.....	.....	1 1/8	2	.....	.....	.....	.....	.....	.....	.....	.....	Opt	34
Apex C-1	3	1/8	1	1	42	2	.....	2	41 1/2	2	.....	2	102	35 1/2
Apex D-1 1/2	3	1/8	1	1	42	2	.....	2	41 1/2	2	.....	2	102	35 1/2
Apex E-2 1/2	3	1/4	1	1 1/4	54	2 1/4	.....	2	53 1/4	2	.....	2	128	31 1/2
Armleder 20	4	1/4	1	1/8	11 1/2	3 3/4	1/4	4	11 1/2	3 1/4	1/4	4	104 1/4	32
Armleder KW 3 1/2—1916-20	4	1/4	1 1/4	1/8	42	3	1/8	1	16	3 3/4	1/4	8	150	36
Armleder HW 2 1/2—1916-20	4	1/4	1 1/4	1/8	13 1/4	3 1/2	1/4	4	13 1/4	3 1/2	1/4	4	140	32
Atco B-1 1/2	4	1/4	1	1	25 1/2	2 1/2	1/8	4	18	2 1/2	1/8	4		32
Atco A-2 1/2	4	1/4	1 1/4	1 1/4	25 1/2	2 1/2	1/8	4	18	2 1/2	1/8	4		33
Atco C-3 1/2	4	1/4	1 1/4	1 1/4	30	2 1/2	1/8	4	22 1/2	2 1/2	1/8	4		34
Atterbury 20R-1 1/2—1920	4	1/8	1	3/8	11 1/8	3 1/4	1/4	4	11 1/8	3 1/4	1/4	4	122 1/8	34
Atterbury 7CX-2 1/2—1919-20	3	1/8	1 1/4	3/8	13 1/8	3 1/2	1/4	4	13 1/8	3 1/2	1/4	4	133 3/8	34
Atterbury 7D-3 1/2—1917-20	3	1/8	1 1/4	3/8	15 3/8	3 3/4	1/4	4	15 3/8	3 3/4	1/4	4	145 3/8	37 1/2
Atterbury 8E-5—1919-20	3	1/4	1 1/2	3/8	17 1/8	4	1/4	4	17 1/8	4	1/4	4	157 1/8	37 1/2
Autocar XXI-F-2—1915-20	4	1/8	1 1/8	.....	16 1/4	2 1/2	1/8	4	13	2 1/2	1/8	4	91	34
Available H-1 1/2—1920	4	1/8	2 1/4	1 1/8	48	2 1/2	1/4	2	36	2 1/2	1/4	2	120	32
Available H2 1/2—1916-20	3	1/8	2 1/4	1 1/8	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	144	32
Available H3—1916-20	3	1/8	2 1/2	1 1/16	16	3 3/4	1/4	4	16	3 3/4	1/4	4	168	36
Available H5—1916-20	3	1/4	2 1/2	1 1/16	18	4	1/4	4	18	4	1/4	4	168	38
Available H7—1919-20	3	1/4	2 1/2	1 1/16	72	3 1/2	1/4	2	72	3 1/2	1/4	2	168	38
Beck-Hawkeye A-1—1912-20	.....	.....	1 1/2	1 1/4	24	2	1/8	1	24	2	1/8	1	114	54
Beck-Hawkeye B-1 1/2—1912-20	.....	.....	1 1/2	1 1/4	24	2	1/8	1	24	2	1/8	1	114	66
Beck-Hawkeye C-2—1912-20	.....	.....	1 3/4	1 1/2	25	2 1/4	1/8	1	25	2 1/4	1/8	1	114	66
Beck-Hawkeye D-3—1920	3	1/8	1 3/4	1 1/2	25	2 1/4	1/8	1	25	2 1/4	1/8	1	136	72
Bell E-1 1/2	4	1/8	1	1/8	39	2 1/2	1/8	1	48	3	1/4	1	114	35
Bell O-2 1/2	4	1/8	1 1/4	1/8	48	2 1/2	1/8	1	54	3	1/4	1	126	35
Belmont A-1	.....	.....	1	1 1/2	32	2	1/8	2	31	1 1/2	1/8	2	78	34
Belmont B-1 1/2	.....	.....	1	1 1/2	41	2	1/4	2	40	1 1/2	1/4	2	120	36
Belmont C-2	.....	.....	1	1 3/4	41	2 1/2	1/4	2	40	2	1/4	2	124	36
Bessemer G-1—1917-20	3	.....	1	1/8	47 1/2	2 1/2	1/8	2	45 1/2	2 1/4	1/8	2	98	34
Bessemer H2-1 1/2—1917-20	3	.....	1	1/8	56 1/2	2 1/2	1/8	2	55	2 1/4	1/8	2	116	34
Bessemer J2-2 1/2—1919-20	3	.....	1 1/4	1/8	56 1/2	2 1/2	1/4	2	55	2 1/4	1/8	2	141	34
Bessemer K2-4—1919-20	3	.....	1 1/4	1/8	58 1/2	3 1/2	1/8	2	30 1/4	4 1/2	1/8	1	157 1/2	38
Bethlehem K-3/4—1920	3	1/8	1	1/4	49	2	1/8	1	21	2	1/8	2	90	32 1/2
Bethlehem G-1 1/2—1920	3	1/8	1 1/4	1/4	43	2 1/2	1/8	1	40 1/2	1 1/4	1/8	2	120	34 1/2
Bethlehem H-2 1/2—1920	3	1/8	1 1/4	1/4	51	3	1/8	1	49	2	1/8	2	132	34 1/2
Bethlehem J-3 1/2—1920	3	1/4	1 1/4	1/4	55	3	1/8	1	50	2	1/8	2	156	34
Brinton F-2 1/2—1914-20	3	1/8	1 1/16	3/8	13	3 1/2	1/4	2	13	3 1/2	1/4	2	135 1/2	33
Brockway 82-1 1/2—1919-20	3	1/8	1	.....	20	2	1/8	4	20	2	1/8	4	118	32
Brockway K4-2 1/2—1919-20	3	1/8	1 1/4	.....	12	3 3/8	1/8	4	12	3 3/8	1/8	4	142	34
Brockway R2-3 1/2—1919-20	3	1/8	1 1/4	.....	15 3/8	3 3/4	1/8	4	15 3/8	3 3/4	1/8	4	176	36
Brockway T-5—1919-20	3	1/4	1 1/2	.....	18	4	1/8	4	18	4	1/8	4	176	36
Capitol H 2 1/2 and K2 1/2	.....	.....	1 1/8	1 1/16	57 1/2	2 1/2	1/8	1	42 1/2	2 1/2	1/8	1	132	34
Capitol G3 1/2	.....	.....	1 1/8	1 1/16	57 1/2	2 1/2	1/8	1	42 1/2	2 1/2	1/8	1	144	34

Name, Model, Tonnage and Year	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Chicago C1 1/2—1919-20	4	.....	1	1 1/8	12 1/8	3 1/4	1/4	4	12 1/8	3 1/4	1/4	4	125	32
Chicago C2 1/2—1919-20	4	.....	1 1/4	1 1/8	13 3/4	3 1/2	1/4	4	13 3/4	3 1/2	1/4	4	135	32
Chicago C3 1/2—1919-20	4	.....	1 1/4	1 1/8	16	3 3/4	1/4	4	16	3 3/4	1/4	4	180	36 3/4
Chicago D5—1920	4	.....	1 1/4	1 1/8	18	4	1/4	4	18	4	1/4	4	180	36 3/4
Climber A20	3	1/8	1	1 1/4	16	2 1/4	1/4	2	16	2 1/8	1/8	2	120	34
Clydesdale 120B-5—1919-1920	3	1/4	1 1/16	1/8	18	4	1/4	4	18	4	1/4	4	207	38
Clydesdale 90-3 1/2—1915-20	3	1/8	1 1/8	1/8	16	3 3/4	1/4	4	16	3 3/4	1/4	4	166 1/2	38
Clydesdale 65X-2 1/2—1919-20	3	1/8	1 1/8	1/8	13 1/4	3 1/2	1/4	4	13 1/4	3 1/2	1/4	4	137	33 1/4
Clydesdale 42-1 1/2—1919-20	3	1/8	1 1/8	1/8	12	3 1/4	1/4	4	12	3 1/4	1/4	4	117 1/2	34
Clydesdale 32X1—1919-20	3	1/8	1 1/8	1/8	20	1 3/4	1/4	4	20	1 3/4	1/4	4	117 1/2	34
Collier 18-1—1919-20	3	1/8	1	1/8	24	3 1/2	1/8	4	24	3 1/2	1/8	4	106	35 1/4
Collier 19-1 1/2—1919-20	3	1/8	1	1/8	24	3 1/2	1/8	4	24	3 1/2	1/8	4	120	32
Collier 21-2—1918-20	3	1/8	1 1/2	1/8	27 1/2	3 1/2	1/8	4	27 1/2	3 1/2	1/8	4	132	32
Collier 22-2 1/2—1919-20	3	1/8	1 1/2	1/8	27 1/2	3 1/2	1/8	4	27 1/2	3 1/2	1/8	4	144	32
Columbia G-2 1/2—1920	3	1/8	1 1/4	1 1/4	55	3	1/8	2	50	2	1/8	2	132	32 1/2
Columbia F-1—1919-20	3	1/8	1	1 1/8	39 1/4	2 1/2	1/8	2	40 1/2	1 3/4	1/8	2	108	32 1/2
Comet-1 1/2	4	1/8	1	1	17 1/4	2 1/4	1/8	2	17 1/4	1 1/2	1/8	2	100	36
Commerce E 1, 1 1/2	3	1/8	1	1/8	45	2 1/2	1/8	2	43	2 1/4	1/8	2	92 5/8	34
Commerce EP 1 1/2, 2	3	1/8	1	1/8	45	2 1/2	1/8	2	43	2 1/4	1/8	2	99 5/8	34
Concord A-1 1/2—1920	3	1/4	1 1/4	1/8	12	3 1/4	1/4	4	12	3 1/4	1/4	4	110 1/4	32 1/8
Concord B-2 1/2—1920	3	1/4	1 1/4	1/8	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	124 5/8	32 1/8
Conestoga 12	3	1/8	1	1/8	39	2	1/8	1	39	2	1/8	1	86	34
Conestoga 20-1	3	1/8	1	1/8	22	2 1/2	1/8	2	14	2 1/2	1/8	2	96	32
Conestoga 30-2	3	1/8	1	1/8	22	2 1/2	1/8	2	14	2 1/2	1/8	2	120	32
Corbitt E-1—1917-20	3	1/8	1	1/8	19	2	1/8	2	19	2	1/8	2	105	34
Corbitt D-1 1/2—1916-20	3	1/8	1 1/4	1/8	45 1/4	2	1/4	1	45 1/4	2	1/4	1	120	34
Corbitt C-2—1915-20	3	1/8	1 1/4	1/8	51 1/2	2 1/4	1/4	1	51 1/2	2 1/4	1/4	1	138	35
Corbitt B-2 1/2—1916-20	3	1/8	1 1/4	1/8	51 1/2	2 1/4	1/4	1	51 1/2	2 1/4	1/4	1	138	35
Corbitt AA-5—1919-20	3	1/4	1 1/2	1/8	69 1/4	3	1/4	1	69 1/4	3	1/4	1	160	38
Corbitt A-3 1/2—1917-20	3	1/8	1 1/4	1/8	64	2 1/2	1/4	1	64	2 1/2	1/4	1	160	35
Couple Gear HC-3 1/2—1906-20	3	.....	2	1 1/4	48	3	1/4	2	.....	.....	.....	.....	168	42
Couple Gear AC-5—1908-20	3	.....	2	1 1/4	48	3	1/4	.....	.....	.....	.....	.....	168	42
Couple Gear LD-6—1917-20	3	.....	2	1 3/4	48	3	1/4	.....	.....	.....	.....	.....	168	42
Dart H-1—1920	3	1/4	1 1/4	1 1/16	19	1 3/4	1/4	4	19	1 3/4	1/8	4	102	34
Dart S-1 1/4—1920	3	1/4	1 1/4	1 1/16	19	1 3/4	1/4	4	19	1 3/4	1/8	4	112	34
Dart M-2 1/4—1920	3	1/4	1 1/4	1 1/16	10	2 1/2	1/8	2	19	3 1/2	1/4	4	124	34
Dart W-3 1/2—1920	3	1/4	1 1/4	1 1/16	28	2 3/4	1/4	4	28	2 3/4	1/4	4	144	38
Day-Elder A-1	3	1/8	1 1/4	1/8	19	2	1/4	4	19	2	1/8	4	108	35
Day-Elder B-1 1/2	3	1/8	1 1/4	1/8	19	2	1/4	4	19	2	1/8	4	119 3/4	35
Day-Elder D-2	3	1/8	1 1/4	1/8	45	2	1/4	2	45	2	1/4	2	125	35
Day-Elder C-2 1/2	3	1/4	1 1/4	1/8	52	2 1/4	1/4	2	52	2 1/4	1/4	2	125 3/4	35
Day-Elder F-3 1/2	3	1/8	1 1/2	1/8	56	2 1/2	1/4	2	56 1/2	2 1/2	1/4	2	148 1/4	35
Day-Elder E-5	3	1/4	1 1/2	1/8	69 1/2	3	1/4	2	69 1/2	3	1/4	2	155	37
Dearborn BW-2—1915-17-19-20	3	.....	1	.....	18	2 1/2	1/8	2	18	1 1/2	1/8	2	130	32
Dearborn F-1 1/2—1915-17-19-20	3	.....	1	.....	16 1/2	2 1/2	1/8	2	16 1/2	1 1/2	1/8	2	96 1/2	34
Dearborn C-1—1915-17-19-20	.....	.....	3/4	.....	38	2	1/8	1	38	2	1/8	1	107	32
Defiance B-1 1/2—1918-19-20	3	1/8	1	.....	45	2 1/2	1/8	1	43 1/8	2 1/4	1/8	1	120	34
Defiance C-2—1918-19-20	3	1/8	1	.....	54 1/8	2 1/2	1/8	1	52 1/2	2 1/4	1/8	1	120	34
De Kalb E2	3	1/8	1 1/4	1 1/4	28	3 1/2	1/8	1	28	3 1/2	1/8	1	120	30
De Kalb E2 1/2	3	1/8	1 1/4	1 1/4	28	3 1/2	1/8	1	28	3 1/2	1/8	1	132	32
Denby 12-1—1920	3	1/8	1	1	43 1/2	2 1/2	1/8	1	39 1/2	1 3/4	1/8	1	98	34
Denby 134-2—1920	3	1/8	1	1	51 1/4	2 1/2	1/8	1	47	2	1/8	1	127	34
Denby 25-3—1920	3	1/8	1 1/4	1 1/4	55 3/4	3	1/8	1	51	2	1/8	1	127	34
Denby 27-4—1920	3	1/8	1 1/4	1 1/4	61 1/2	3	1/8	1	8 1/2	4	1/4	2	140	34
Denby 210-5—1920	3	1/8	1 1/4	1 1/4	89	2 3/4	1/8	1	8 1/2	4	1/4	2	140	34
Dependable C-1 1/2—1920	4	.....	1	.....	53 1/2	2 1/2	1/8	1	39 1/4	2 1/2	1/8	1	121	33
Dependable E-2 1/2—1920	4	.....	1	.....	62 1/8	2 1/2	1/8	1	48	2 1/2	1/8	1	152	33
Diamond T-FS&T-1 1/2	3	1/8	1	1 1/4	13 1/4	3 1/2	1/4	8	13 1/4	3 1/2	1/4	8	123 1/4	34
Diamond T-U-2	3	1/8	1	1 1/4	13 1/4	3 1/2	1/4	8	13 1/4	3 1/2	1/4	8	132	34

Replacement Table—Continued

Name, Model, Tonnage and Year	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Diamond TK–3½	3	⅛	1¼	1½	16	3¾	¼	8	16	3¾	¼	8	145	37
Diamond T-EL–5	3	⅛	1¼	1½	16	3¾	¼	8	16	3¾	¼	8	143	37
Diamond T-S–5	3	⅛	1¼	1¼	18½	4	¼	8	18½	4	¼	8	156 5/8	37
Diehl A	3	.....	1	1	28	2½	⅛	2	27	2	⅛	2	90	.....
Doane 2½—1917–18–19–20	3	¼	1½	⅛	35	3	¼	2	34	3	¼	4	126	53
Doane 3½—1920	3	¼	1¼	⅛	35	3	¼	2	34	3	¼	4	156	60
Doane 6.—1917–18–19–20	3	.....	1½	⅛	38	3	¼	2	46	4	¼	4	168	64
Dodge Brothers–½—1917–20	3	⅛	1	⅛	19¼	2¼	⅛	2	14¾	1¾	⅛	2	47 3/8	38
Dorris K4–4—1918–20	3	¼	1¼	1¼	13½	3½	¼	4	13½	3½	¼	4	142¾	34
Dorris K7–3½—1919–20	3	¼	1¼	1¼	15¾	3¾	¼	4	15¾	3¾	¼	4	179½	36
Double Drive B 3	4	¼	1¼	1¾	29	2¼	¼	1	29	2¼	¼	1	124	36
Douglas GW–1½	3	.....	1¼	¼	45	2½	⅛	2	44	2¼	⅛	2	118	31
Douglas G–1½	3	.....	1¼	¼	46	2½	⅛	2	44	2¼	⅛	2	118	31
Douglas H–2	3	.....	1¼	¼	55	2½	⅛	2	52	2¼	⅛	2	118	31
Douglas HW–2	3	.....	1¼	¼	54	2½	⅛	2	42	2¼	⅛	2	118	31
Douglas I–3	3	.....	1¼	¼	58	2½	⅛	2	44	2¼	⅛	2	132	31
Duplex E–3½	3	¼	1¼	1	9½	2½	¼	2	5½	2½	¼	2	126	39 5/8
Duplex A	.....	.....	1¼	1½	.....	2	.....	4	.....	2	.....	4	121	34
Duty 2–1920	3	⅛	1½	1¼	45	2½	⅛	1	40	1¾	⅛	1	123	44
Eagle 100–2	4	¼	1	1¼	49½	3	¼	1	47¼	2	¼	1	Opt	36
Ellsworth 25A–½—1918–20	3	⅛	1¼	1¼	12	1¼	¼	4	12	1¼	¼	4	Opt	36
Elmira C1½–3½	.....	.....	1	1¼	24	1	⅛	1	24	1	⅛	1	60	30
Fageol 1½—1920	3	¼	1	1½	19¼	1¾	⅛	2	19¼	1¾	⅛	2	120	30
Fageol 2½—1917–20	3	¼	1½	1	13¼	3½	¼	2	13¼	3¼	¼	2	135	34
Fageol 4500.—1917–20	3	¼	1⅝	2	15½	3¾	⅛	2	15½	3¾	⅛	2	161¼	37¾
Fageol 5300.—1917–20	3	¼	1⅝	2	18	4	⅛	2	18	4	⅛	2	161¼	37¾
Famous B10–1—1919–20	3	⅛	1	⅛	21	2¾	¼	1	48	2	⅛	2	94	34
Famous B12–1½—1919–20	3	⅛	1	⅛	21	2½	¼	1	48	2	⅛	2	94	34
Fargo O17, P18–2, P19–2, P20–2	3	⅛	.....	1⅛	52	3	⅛	2	50½	2	⅛	2	132	33
Federal SD–1	4	⅛	1	1⅛	10 11	3	¼	4	10 11	3	¼	4	112	34
Federal TE–1½	3	⅛	1¼	1½	13	3½	¼	4	13	3½	¼	4	118	34
Federal UE–2	3	⅛	1¼	1½	13	3½	¼	4	13	3½	¼	4	134	34
Federal WE–3½	3	⅛	1¼	1½	15⅝	3¾	¼	4	15⅝	3¾	¼	4	154	38
Federal XE–5	3	⅛	1¼	1½	17 11	4	¼	4	17 11	4	¼	4	154	38
Federal Light Duty	3	⅛	1¼	1½	13	3½	¼	4	13	3½	¼	4	86	34
Federal Heavy Duty	3	⅛	1¼	1½	15⅝	3¾	¼	4	15⅝	3¾	¼	4	82	38
Ford T–1	3	¼	1⅛	1	23⅛	1	11	1	12	1⅛	⅛	2	124	23
Front-Drive C1½	4	⅛	1	1½	13	3	¼	2	15	3	¼	2	124	36
F.W.D. B–3	3	¼	1	⅛	27	3½	¼	1	43	2¾	¼	2	136	36
Garford 25–1¼—1920	3	⅛	1¼	.....	11¾	3¼	¼	4	11¾	3¼	¼	4	108	34
Garford 70H–2—1920	4	¼	1¼	.....	13	3½	¼	4	13	3½	¼	4	121	34
Garford 77D–3½—1920	4	¼	1¼	.....	15⅝	3¾	¼	4	15⅝	3¾	¼	4	144	36
Garford 77C–3½—1920	3	¼	1¼	.....	15⅝	3¾	¼	4	15⅝	3¾	¼	4	150	32
Garford 68–5—1920	3	¼	1¼	.....	10½	4	⅜	2	21⅝	4	¼	4	150	32
Gary F–1	3	⅛	1	⅜	22½	3	¼	2	22½	3	¼	2	114	34
Gary GTI–1½	4	⅛	1¼	⅜	24	3¼	¼	2	24	3¼	¼	2	120	34
Gary J–2½	4	⅛	1¼	⅜	27	3½	¼	2	27	3½	¼	2	120	34
Gary K–3½	4	⅛	1¼	⅜	32	3¾	¼	2	32	3¾	¼	2	148	36¾
Gary M–5	4	⅛	1½	⅜	36½	4	¼	2	36½	4	¼	2	168	39
Gersix K–2¼—1920	3	⅛	1¼	1¼	20	2½	¼	4	47	2¼	¼	2	131	34
Gersix M–1½—1920	3	⅛	1¼	1½	46	2	¼	2	46	2	¼	2	114	32
Giant 15–1	3	⅛	1	.....	19	2	⅛	2	19	2	⅛	2	116½	32
Giant 16–2	3	⅛	1¼	.....	45½	2	⅛	2	45½	2	⅛	2	140½	33
Giant 17–3½	3	⅛	1½	.....	56½	2½	¼	2	46½	2½	¼	2	183½	36
G.M.C. 16–¾—1916–20	3	⅛	1	1	40 11	1⅞	⅛	2	43	1⅞	⅛	2	92½	34
G.M.C. 31A–1½—1915–20	3	⅛	1	1	13	3½	¼	4	13	3½	¼	4	101	33
G.M.C. 31B–1½—1915–20	3	⅛	1	1	13	3½	¼	4	13	3½	¼	4	125	33
G.M.C. 41A–2—1915–20	3	⅛	1	1	13	3½	¼	4	13	3½	¼	4	125¾	33
G.M.C. 41B–2—1915–20	3	⅛	1	1	13	3½	¼	4	13	3½	¼	4	149¾	33
G.M.C. 71A–3½—1916–20	3	⅛	1¼	1¼	15⅝	3¾	¼	4	15⅝	3¾	¼	4	144	38
G.M.C. 71B–3½—1916–20	3	⅛	1¼	1¼	15⅝	3¾	¼	4	15⅝	3¾	¼	4	192	38
G.M.C. 101A–5—1916–20	3	⅛	1¼	1¼	17 11	4	¼	4	17 11	4	¼	4	144	38
G.M.C. 101B–5—1916–20	3	⅛	1¼	1¼	17 11	4	¼	4	17 11	4	¼	4	192	38
Gramm-Bernstein 15–1½—1920	3	⅛	1	1½	48½	2	⅛	2	46½	1½	⅛	2	120	32
Gramm-Bernstein 65–1½—1920	3	⅛	1	1½	18	1¾	¼	4	18	1¾	¼	4	120	32
Gramm-Bernstein 20–2—1920	3	⅛	1¼	1½	22½	2	⅛	4	22½	2	⅛	4	126	32 1/4
Gramm-Bernstein 25–2½—1920	3	⅛	1¼	1½	22½	2¼	¼	4	22½	2¼	¼	4	132	36
Gramm-Bernstein 35–3½—1920	3	⅛	1¼	1½	26	2¾	¼	4	26	2¾	¼	4	144	36

Name, Model, Tonnage and Year	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Gramm-Bernstein 50–5—1920	3	¼	1½	1¾	32½	2¾	¼	4	32½	2¾	¼	4	162	36
Grant 10–1½—1920	3	⅛	1⅛	.....	45	2½	⅛	2	43	2¼	⅛	2	104 5/8	35 1/4
Grant 11–1½—1920	3	⅛	1⅛	.....	45	2½	⅛	2	43	2¼	⅛	2	131⅞	35 1/4
Grant 15–2—1920	3	⅛	1⅛	.....	54	2½	⅛	2	52	2¼	⅛	2	104 5/8	35 1/4
Grant 16–2—1920	3	⅛	1⅛	.....	54	2½	⅛	2	52	2¼	⅛	2	131⅞	35 1/4
Grant 17A—1920	3	⅛	1⅛	.....	45	2½	⅛	2	43	2¼	⅛	2	131⅞	35 1/4
Hall 2-Worm–2½	3	⅛	.....	.....	13½	3½	¼	2	13½	3½	¼	4	144	38
Hall 3½-Worm	3	⅛	.....	.....	16	3¾	¼	2	16	3¾	¼	4	180	39
Hall 5-Worm	3	⅛	.....	.....	18½	4	¼	2	18½	4	¼	4	144	39
Hall 7-Chain	3	⅛	.....	.....	37	2½	¼	1	59	4	¼	1	180	39
Harvey WEA–1½—1919–20	4	¼	.....	.....	46	2	¼	2	46	2	¼	2	120	32
Harvey WFA–2½—1919–20	4	¼	.....	.....	52	2¼	¼	2	52	2¼	¼	2	126½	32
Harvey WHA–3½—1919–20	4	¼	.....	.....	56	2½	¼	2	56	2½	¼	2	144	35
Harvey WKA–5—1919–20	4	¼	.....	.....	69	3	¼	2	69	3	¼	2	144	35
Hawkeye K–1½—1918–20	3	⅛	1¼	1½	48	2	⅛	2	47	1½	⅛	2	112	34
Hawkeye M–2.—1919–20	3	⅛	1¼	1½	54	2½	⅛	2	52	2	⅛	2	112	34
Hendrickson I–2½	3	¼	1¼	⅛	12	3½	⅛	4	12	3½	⅛	4	Opt	32½
Hendrickson J–3½	3	¼	1¼	⅛	16	3¾	⅛	4	16	3¾	⅛	4	Opt	36
Hendrickson K–5	3	¼	1½	⅛	18	4	⅛	4	18	4	⅛	4	Opt	38
Highway-Knight A	4	¼	1½	1¾	57	2½	¼	1	57	2½	¼	1	150	38
Highway-Knight B–5	4	¼	1½	1¾	69	3	¼	1	69	3	¼	1	150	38
Higrade A18–1—1918–19	3	¼	1	1	12	1½	¼	2	12	1½	¼	2	85	32
Higrade B20–1½—1919–20	3	¼	1½	1½	18	2	¼	2	18	2	¼	2	100	32
Hood C	3	¼	1	¼	23	1	⅛	1	23	2½	¼	2	30	23
Hoover 15B–1	3	⅛	1	1¾	16	1¾	¼	2	16	1¾	¼	2	82	35½
Hoover 20A–1½	3	⅛	1	1¾	19	2	⅛	2	19	2	⅛	2	105	33
Huffman B–1½—1919–20	3	⅛	1	¼	44	2¼	⅛	2	44	1½	⅛	2	123	32
Huffman C–1½—1919–20	3	⅛	1	⅛	46	2½	⅛	2	44	2¼	⅛	2	123	32
Hurlburt A1½-2	3	.....	1¼	1	22	2	¼	2	22	2	¼	2	132	35½
Hurlburt B2½	3	⅛	1¼	1	24	2½	¼	2	23	2½	¼	2	154	34
Hurlburt C3½-4	3	¼	1½	1¼	26	3	¼	2	25	3	¼	2	144½	34
Hurlburt D5-5½	3	¼	1½	1¾	28	3	¼	2	27	3	¼	2	144½	34
Indiana 12–1¼—1920	3	¼	1	.....	17½	2	¼	8	17½	2	¼	8	108	32
Indiana 20–2—1920	3	¼	1¼	.....	44	2	¼	4	44	2	¼	4	126	33
Indiana 25–2½—1920	3	¼	1¼	.....	51	2¼	¼	4	51	2¼	¼	4	138	33
Indiana 35—1920	3	¼	1¼	.....	56	2½	¼	4	56	2½	¼	4	144	34½
Indiana 51–5—1920	3	¼	1½	.....	68	3	¼	4	68	3	¼	4	156	37½
International H–¾—1916–20	3	¼	1¼	1¾	43¾	2¼	⅛	2	43¾	2¼	⅛	2	75 11	34
International F–1—1916–20	3	¼	1½	1¾	43¾	2¼	⅛	2	43¾	2¼	⅛	2	88 11	34
International K–1½—1918–20	3	¼	1½	1¾	50⅝	2¼	⅛	2	50⅝	2¼	⅛	2	92 11	34
International G–2—1918–20	4	¼	1¼	1¾	50⅝	2¼	⅛	2	50⅝	2¼	⅛	2	118 11	34
International L–3½—1920	4	¼	1¼	1¾	73	2½	¼	2	73	2½	⅛	2	147⅝	34
Jackson B–3½	3	⅛	1¼	1½	58½	3½	¼	2	.....	.....	.....	.....	150	36
Jumbo 15–1½—1919	4	¼	.....	1	48½	2	⅛	2	47	1½	⅛	2	120	32
Jumbo 20–2—1919	4	¼	.....	1	48½	2	⅛	2	47	1½	⅛	2	120	32
Jumbo 25–2½—1917–19	3	¼	.....	1¼	49¾	3	⅛	2	47½	2½	⅛	2	116	34
Jumbo 30–3—1917–19	3	¼	.....	1¼	49¾	3	⅛	2	47½	2½	⅛	2	116	34
Jumbo 35–3½—1919	4	¼	.....	1¼	60½	3	⅛	2	58½	2½	⅛	2	144	36
Jumbo 40–4—1919	4	¼	.....	1¼	60½	3	⅛	2	58½	2½	⅛	2	144	36
Kalamazoo G–1½	3	¼	1⅛	1⅛	50	2¼	⅛	1	.....	.....	.....	.....	120	32 1/2
Kalamazoo H–2½	3	¼	2⅛	1⅛	90	2½	⅛	1	48	2½	⅛	1	144	33
Kalamazoo K–3½	3	¼	2⅛	1⅛	60	2½	⅛	1	60	2½	⅛	1	152	36
Kankankee E–2½—1919–20	3	¼	1⅛	1¼	50	3	⅛	1	46½	2	⅛	1	148½	32
Karavan A–2½	4	¼	1 11	1 11	51	2¼	⅛	1	51	2¼	⅛	1	132	33
Kearns H–¾	.....	.....	.....	.....	42	2	⅛	1	42	2	⅛	1	90	34
Kearns N–1½	.....	.....	.....	.....	45	2½	⅛	1	45	2¼	⅛	1	120	34
Keldon 19–2	4	⅛	1¼	1¼	48	3	⅛	1	45	3	⅛	1	132	34
Kelly-Springfield K31–1½	4	¼	1	⅛	16¾	1⅞	⅛	4	16¾	1⅞	⅛	4	141	34
Kelly-Springfield K34–1½	4	¼	1	⅛	42½	2	⅛	4	42½	2	⅛	4	141	34
Kelly-Springfield K35–2½	4	¼	1	⅛	16¾	1⅞	⅛	4	16¾	1⅞	⅛	4	141	34
Kelly-Springfield K36–2½	4	¼	1	⅛	48⅞	2¼	¼	4	48⅞	2¼	¼	4	141	34
Kelly-Springfield K40–3½	4	¼	1¼	⅛	21	2⅛	¼	4	21	2⅛	¼	4	145	38
Kelly-Springfield K41–3½	4	¼	1¼	⅛	3	4½	¼	12	58	2½	¼	4	144	36
Kelly-Springfield K42–3½	4	¼	1¼	⅛	27½	2¾	¼	8	27½	2¾	¼	4	144	36
Kelly-Springfield K45–4	4	¼	1¼	⅛	21	2⅛	¼	4	21	2⅛	¼	4	145	38
Kelly-Springfield K50–5	4	¼	1¼	⅛	21	2¾	¼	4	21	2¾	¼	4	145	38
Kelly-Springfield K60–6	4	¼	1¼	⅛	21	2¾	¼	4	21	2¾	¼	4	145	38
Keystone 40–2—1919–20	3	¼	1	⅛	50½	2	⅛	1	46¾	2	⅛	1	124	33

Kimball AB–1½	3	¼	1¼	.....	50	2¼	¼	4	33	3½	¼	1	135		34
Kimball AC–2½	3	¼	1¼	.....	52	2½	¼	4	33	3½	¼	1	152		34
Kimball AK–3	3	¼	1½	.....	52	2½	¼	4	33	3½	¼	1	152		34
Kimball AE–4	3	¼	1½	.....	58	3	¼	4	58	3	¼	2	171		36
Kimball AF–5	3	¼	1½	.....	65	3	¼	4	65	3	¼	2	171		36
King-Zeitler 1½—1919–20	3	¼	1	1¼	48	3¼	¼	4	48	3¼	¼	4	Opt		32
King-Zeitler 2½—1919–20	3	¼	1	1¼	54	3½	¼	4	54	3½	¼	4	Opt		32
King-Zeitler 3½—1919–20	3	¼	1¼	1¼	63	3¾	¼	4	63	3¾	¼	4	Opt		36
Kissel-Utility–1½—1917–20	3	¼	.....	1¼	19	2	¼	4	19	2	¼	4	120		34
Kissel-Freighter–2—1917–20	3	¼	.....	1¼	14	3½	¼	4	14	3½	¼	4	144		34
Kissel-Heavy-Duty–3½—1917–20	3	¼	.....	1¼	56	2½	¼	2	56	2½	¼	2	156		36
Kissel-Goliath–5—1919–20	3	¼	.....	1¼	56	2½	¼	2	56	2½	¼	2	168		36
Kleiber 1	3	¼	1¼	1¼	12	3½	¼	4	12	3½	¼	4	120		34
Kleiber 1½	3	¼	1¼	1¼	45	2	4	2	45	2	¼	2	132		34
Kleiber 2	3	¼	1¼	1¼	13½	3½	4	4	13½	3½	¼	4	144		34
Kleiber 2½	3	¼	1¼	1¼	52	2¼	4	2	52	2¼	¼	2	150		38
Kleiber 3½	3	¼	1¼	1¼	16	3¾	4	4	16	3¾	¼	4	156		34
Kleiber 5	4	¼	1½	1¼	18	4	4	4	18	4	¼	4	168		38
Knox 35—1915–20	4	¼	1½	.....	.....	.....	.....	.....	57¾	6½	¼	1	27	⅞	28
Knox 36–3—1915–20	4	¼	1½	.....	.....	.....	.....	.....	57¾	6½	¼	1	96	⅞	28
Koehler C 1¼—1919–20	3	¼	1	¼	47	2½	¼	2	46	2¼	¼	2	108		34
Koehler M 2½—1919–20	4	¼	1¼	¼	13½	3½	¼	4	13½	3½	¼	4	144		34
Lange–2	3	¼	1	1⅛	30	2	¼	2	18	3	¼	4	114		37
Larrabee-Deyo U–1½—1919–20	3	¼	1	.....	48	2	¼	2	48	2	¼	2	108		34
Lar.-Deyo A, B '18–19 & L–'20–3½	3	¼	1¼	.....	60	2½	¼	2	60	2½	¼	2	168		36
Lar.-Deyo C, D'18–19 & K'20–2½	3	¼	1¼	.....	54	2¼	¼	2	54	2¼	¼	2	150		36
Larrabee-Deyo W–5—1920	3	¼	1½	.....	72	3	¼	2	72	3	¼	2	152		36
Larrabee-Deyo T—1918–19	3	¼	1¼	.....	72	3	¼	2	72	3	¼	2	157		36
L. M. C.–2½—1919–20	3	¼	1¼	1½	55	3	¼	2	50½	2	¼	2	143		32
Lombard 140H.P.	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	120		79
Luedinghaus K2—1919–20	3	¼	1¼	1⅛	53.4	2½	¼	2	38½	2½	¼	2	120		34
Luedinghaus K2–LS—1920	3	¼	1¼	1⅛	53.4	2½	¼	2	38½	2½	¼	2	145½		34
Luverne BBL–2	3	¼	1¼	1¼	.....	2½	¼	2	.....	2½	¼	2	108		34
Maccar L–1½—1915–19	3	¼	1¼	⅝	11	3¼	¼	4	11	3¼	¼	4	128½		34
Maccar H–2½—1915–20	3	¼	1¼	⅝	13	3½	¼	4	13	3½	¼	4	143⅝		34
Maccar M–3½—1915–17–19–20	3	¼	1¼	⅝	15½	3¾	¼	4	15½	3¾	¼	4	155⅞		34
Maccar G–5½—1919–20	3	¼	1¼	⅝	17¾	4	¼	4	17¾	4	¼	4	167		37½
Mack AB 1½, 2 Ton-Chain '16–20	4	¼	1¼	¼	12¼	4	¼	2	16½	2½	¼	4	Opt		33¼
Mack AB 1½, 2 Ton-Worm '16–20	4	¼	1¼	¼	13	3½	¼	2	16½	2½	¼	4	Opt		33¼
Mack AB-Tractor 5 Ton—'16–20	4	¼	1¼	¼	12¼	4	¼	2	16½	2½	¼	4	77		33¼
Mack AC 3½ to 7½ Ton—'16–20	4	¼	1½	¼	16⅞	3	¼	4	20½	3½	¼	4	Opt		37½
Mack AC Trac. 7to15Ton—'16–20	4	¼	1½	¼	16⅞	3	¼	4	20½	3½	¼	4	87		37½
Master J1–1½—1919–20	3	¼	1¼	2	74½	2½	⅛	1	74½	2¼	¼	1	117¾		34⅛
Master JW–1½—1919–20	3	¼	1¼	2	12	3¼	¼	2	12	3¼	¼	2	117¾		34⅛
Master M–2½—1916–20	3	¼	1¼	2	74½	2½	⅛	1	74½	2¼	¼	1	117⅜		34
Master O–2½—1917–20	3	¼	1¼	2	74½	2½	⅛	1	74½	2¼	¼	1	156⅜		34
Master W–2½—1916–20	3	¼	1¼	2	13¼	3½	¼	2	13¼	3½	¼	2	117⅜		34
Master WL–2½—1917–20	3	¼	1¼	2	13¼	3½	¼	2	13¼	3½	¼	2	156⅜		34
Master D–2½—1920	3	¼	1¼	2	8⅝	4½	⅛	2	54	3	⅛	2	117⅜		34
Master DL–2½—1920	3	¼	1¼	2	8⅝	4½	⅛	2	54	3	⅛	2	156⅜		34
Master T–6 Tractor—1917–20	3	¼	1¼	2	74½	2½	⅛	1	74½	2¼	¼	1	72⅛		34
Master A–3½—1918–20	4	¼	1½	1¾	16	3¾	¼	2	16	3¾	¼	2	147¾		36¾
Master AL–3½—1918–20	4	¼	1½	1¾	16	3¾	¼	2	16	3¾	¼	2	183¾		36¾
Master E–3½—1920	4	¼	1½	1¾	11	6	¼	2	25	4	¼	4	147¾		36¾
Master EL–3½—1920	4	¼	1½	1¾	11	6	¼	2	25	4	¼	4	183¾		36¾
Master B–5—1919–20	4	¼	1½	1¾	18	4	¼	2	18	4	¼	2	162⅞		39
Master BL–5—1919–20	4	¼	1½	1¾	18	4	¼	2	18	4	¼	2	186⅞		39
Master F–5—1920	4	¼	1½	1¾	11	6	¼	2	25	4	¼	4	162⅞		39
Master FL–5—1920	4	¼	1½	1¾	11	6	¼	2	25	4	¼	4	186⅞		39
Maxwell 1½1917–20	3	¼	1	1	16	1¾	¼	4	16	1¾	¼	4	102		36
Menominee HT–1—1918–20	3	¼	1	1½	12	3¼	¼	8	.....	.....	.....	.....	104		32
Menominee H–1½—1916–20	3	¼	1¼	1¾	13½	3½	¼	8	.....	.....	.....	.....	122		32
Menominee D–2.—1915–20	3	¼	1¼	1¾	13½	3½	¼	8	.....	.....	.....	.....	146		32
Menominee G–3½—1916–20	3	¼	1½	2	16	3½	¼	8	.....	.....	.....	.....	155		36
Menominee J–5—1917–20	3	¼	1½	2	18½	4	¼	8	.....	.....	.....	.....	156		38
Menominee Ht–1—1920–late	3	¼	1	1½	47	2½	¼	2	33¼	2½	¼	2	104		32
Menominee H–1—1920–late	3	¼	1¼	1¾	47	2½	¼	2	33¼	2½	¼	1	122		32
Menominee D–2—1920–late	3	¼	1¼	1¾	57½	2½	¼	2	42½	2½	¼	2	146		32
Menominee G–3½—1920–late	3	¼	1½	2	57½	2½	¼	2	42½	2½	¼	2	155		36
Menominee J–5—1920–late	3	¼	1½	2	69	3½	¼	2	52	2½	¼	2	156		38
Moreland 19B–1½—1918–19	3	¼	1¼	1¾	12	3¾	¼	4	12	3¼	¼	4	132		34
Moreland 19C–2½—1918–19	3	¼	1½	1¾	13½	3½	¼	4	13½	3½	¼	4	156		34
Moreland 19G–4—1918–19	3	¼	1½	1¾	16	3¾	¼	4	16	3¾	¼	4	168		38
Moreland 19J–5—1918–19	3	¼	1½	1¾	18	4	¼	4	18	4	¼	4	168		38
Muskegon 20–2	3	¼	1¼	2	54	2½	¼	2	53	2¼	¼	2	119½		34
Mutual–2—1919–20	3	¼	1	1¼	51	2¼	¼	2	51	2¼	¼	2	128¾		34
Mutual 2A—1919–20	3	¼	1	.....	51	.....	.....	2	51	.....	.....	.....	128¾		34
Napoleon 9–1—1919–20	3	¼	1	¼	44	2	¼	1	30	2½	¼	1	102		35
Napoleon 11–1½—1919–20	3	¼	1	¼	49	2	¼	1	30	2½	¼	1	102		35
Nash 2018–1—1919–20	4	¼	1¼	1¼	49½	2	¼	2	20	2½	¼	1	104½		30½
Nash 3018–2—1919–20	4	¼	1¼	1¼	50⅝	3	¼	2	20	2½	¼	1	118¼		31⅝
Nash 4017–2—1919–20	3	¼	1¼	1¼	49¼	2½	¼	4	25	2½	¼	1	117½		38½
Nelson & LeMoon F1	3	¼	1¼	¼	12	3¼	¼	2	12	3¼	¼	2	Opt		.....
Nelson & LeMoon F1½	3	¼	1¼	¼	12	3¼	¼	2	12	3¼	¼	2	Opt		.....
Nelson & LeMoon F2	3	¼	1¼	¼	12	3¼	¼	2	12	3¼	¼	2	Opt		.....
Nelson & LeMoon F3½	3	¼	1¼	¼	16½	3¾	¼	2	16½	3¾	¼	2	Opt		.....
Nelson & LeMoon F5	4	¼	1½	¼	18	4	¼	2	18	4	¼	2	Opt		.....
Netco D–2	3	¼	1¼	1¼	12	3½	¼	4	12	3½	¼	4	139½		34¼
Netco H–2½	3	¼	1½	1¼	13	3½	¼	4	13	3½	¼	4	144		34¼
Niles E–2	3	¼	1¾	1¾	12	3¾	¼	4	12	3¾	¼	4	114		.....
Noble A20–1—1919–20	4	¼	1	1¼	18	2	¼	4	18	2	¼	4	124		34
Noble B30–1½—1918–20	4	¼	1	1¼	43	2	¼	4	43	2	¼	2	136		34
Noble C40–2—1919–20	4	¼	1¼	1¼	43	2	¼	4	43	2	¼	2	148		34
Noble D50–2½—1919–20	4	¼	1¼	1¼	51	2¼	¼	4	51	2¼	¼	2	172		34
Noble E70–3½—1919–20	4	¼	1¼	1¼	57	2½	¼	4	57	2½	¼	2	172		36
Northway B2–2	3	¼	1¼	1¾	50½	2¼	¼	2	50½	2¼	¼	2	133		33
Northway B–2	3	¼	1¼	1¾	50½	2¼	¼	2	50½	2¼	¼	2	118		33
Northway B–3	3	¼	1¼	1¾	54	2½	¼	2	54	2½	¼	2	173		34⅝
Northway–3½	3	¼	1¼	1¾	54	2½	¼	2	54	2½	¼	2	148		34⅝
O. K.–1½—1920	4	¼	1¼	1	53	2½	¼	2	38	2½	¼	2	117		34
O. K.–2½—1920	4	¼	1¼	1	62	2½	¼	2	48	2½	¼	2	125		35
O. K.–3½—1920	4	¼	1¼	1	62	2½	¼	..	48	2½	¼	2	133		34
Old Hickory W–1—1919	3	¼	1½	1	24	2¼	¼	2	24	2¼	¼	2	120		36
Old Reliable A–1½—1918–20	3	¼	1¼	1¼	48	2½	¼	1	48	2½	¼	1	105		32
Old Reliable B–2½—1918–20	3	¼	1¼	1¼	54	2	¼	1	54	2	¼	1	144		32
Old Reliable C–3½—1918–20	3	¼	1¼	1¼	60	2½	¼	1	60	2½	¼	1	150		32
Old Reliable D–5—1918–20	3	¼	1½	1½	72	3	¼	1	72	3	¼	1	156		34
Old Reliable K, L, M–7—1918–20	3	¼	1½	1½	54	3½	¼	1	60	4	¼	1	158		36
Oldsmobile T–¾—1919–20	3	¼	1¼	1⅜	42¼	2	¼	1	41	2	¼	1	92	⅝	34
Oneida A 9–1¼	3	¼	1	.....	48	2½	¼	2	34	2½	¼	2	106		34
Oneida B 9–1¾	3	¼	1¼	.....	48	2½	¼	2	34	2½	¼	2	114		34
Oneida C 9–2½	3	¼	1¼	.....	58	2½	¼	2	43	2½	¼	2	138		34
Oneida D 9–3½	3	¼	1¼	.....	16	4	¼	4	16	4	¼	4	157		36
Oneida E 9–5	3	¼	1¼	.....	18	4	¼	4	18	4	¼	4	178		38
Oshkosh A–2	3	¼	1¼	2	23	3	¼	1	43	2½	¼	2	108	⅝	34
Oshkosh AA–2	3	¼	1¼	2	23	3	¼	1	43	2½	¼	2	143	⅝	34
Packard E., C	3	¼	1⅝	1¾	7	4¼	¼	2	14	2	¼	2	132		31¾
Packard E., D	3	¼	1⅝	1¾	9	4¼	¼	2	17	3	¼	2	144		39
Packard E., F	3	¼	1⅝	1¾	9	6½	¼	2	18¾	3½	¼	2	144		39
Packard EY	3	¼	1⅝	1¾	9	4¾	¼	2	17	3	¼	2	144		39
Packard EX	3	¼	1⅝	1¾	9	6½	¼	2	18¾	3½	¼	2	156		39
Paige 50–18–2½	3	¼	.....	1¼	49⅝	2	¼	4	49⅝	2	¼	4	126		33
Paige 51–18–3½	3	¼	.....	1¼	15⅝	3¾	¼	4	15⅝	3¾	¼	4	144		35
Paige 52–19–1½	3	¼	.....	1¼	11½	3¼	¼	4	11½	3¼	¼	4	126		33
Parker F20–2—1920	3	¼	1¼	1½	10¾	5	¼	2	19	2½	¼	4	127		33
Parker J20–3½—1920	3	¼	1¼	1½	10¾	5	¼	2	19	3½	¼	4	139½		33
Parker M20–5—1920	3	¼	1½	1¾	10¾	5	¼	2	24½	4	¼	4	145		37
Patriot Lincoln–2	3	¼	1	1¼	41	1¾	¼	2	41	1¾	¼	2	112		34
Patriot Revere–1	3	¼	1	1¼	41	1¾	¼	2	41	1¾	¼	2	92½		33¼
Patriot Washington–3	3	¼	1	1¼	55	2¼	¼	2	55	2¼	¼	2	150		34
Pierce Arrow–2–X–5	.....	.....	1	1⅞	22¼	2¼	¼	4	22¼	2¼	¼	4	126	⅜	34⅛
Pierce Arrow–3½–W–2	.....	.....	1	2	9	6	¼	2	18	4¾	¼	4	134½		38⅛
Pierce Arrow–5–R–10	.....	.....	1	2	9	6	¼	2	21	4¾	¼	4	140½		38⅛
Pittsburgher 2½—1919–20	3	¼	1¼	1¼	44	2¼	¼	2	44	2¼	¼	2	136		24
Pony ¼	3	¼	⅛	⅛	.....	.....	.....	.....	10	1½	⅛	2	40		33
Pony 2	3	¼	1¼	1½	.....	.....	.....	.....	.....	.....	.....	.....	132		33
Pony 3½	4	¼	1¼	1½	.....	.....	.....	.....	.....	.....	.....	.....	156		36
Rainier R–8–2	3	¼	1¼	¼	44½	2	¼	1	44½	2	¼	1	124⅛		34
Rainier R6–1½	3	¼	1¼	¼	19	2	¼	2	19	2	¼	2	97¾		34
Rainier R9–1	3	¼	1¼	¼	19	2	¼	2	19	2	¼	2	87¾		34
Rainier R11–¾	3	¼	1¼	¼	11¼	3	¼	2	11¼	2	¼	2	87¾		34
Reliance 10A–1½—1920	3	¼	1¼	⅛	17	2	¼	4	17	2	¼	4	122		32
Reliance 20B–2½—1920	3	¼	1¼	⅛	17	2	¼	4	17	2	¼	4	127		32
Reo F—1500-2500-lbs	3	¼	1	1	43	2¼	¼	1	31½	2	¼	2	82		30
Republic 10–1—1919–20	3	¼	1	.....	45	2½	¼	2	43	2¼	¼	2	98		34
Republic 11X–1½—1919–20	3	¼	1	.....	54¾	2½	¼	2	52⅛	2¼	¼	2	118		34
Republic 19–2½—1919–20	3	¼	1¼	.....	54¾	2½	¼	2	52⅛	2¼	¼	2	121		34
Republic 20–3½—1919–20	3	¼	1¼	.....	55¾	3½	¼	2	31	4½	¼	1	146		37
Reynolds 3A–1½	3	¼	1¼	.....	46	2	¼	2	46	2	¼	2	121		33
Reynolds 5A–2½	3	¼	1¼	.....	52½	2¼	¼	2	52½	2¼	¼	2	126		33
Reynolds 7A–3½	3	¼	1¼	.....	57	2½	¼	2	57	2½	¼	2	148		37
Reynolds 10A–5	3	¼	1¼	.....	70	3	¼	2	70	3	¼	2	148		37
Riker B3, BB–4	5	¼	.....	.....	7¾	4½	¼	2	20	4	¼	2	150		38
Rowe CW–1½—1918–19–20	3	¼	1	¼	19	2	¼	8	19	2	¼	8	121½		33
Rowe CDW2—1916–20	3	¼	1¼	¼	45	2	¼	4	45	2	¼	4	123		33
Rowe GSW3—1918–20	3	¼	1¼	¼	51½	2½	¼	4	51½	2½	¼	4	147		33
Rowe HW4—1918–20	3	¼	1¼	¼	56½	2½	¼	4	56½	2½	¼	4	150		36
Rowe FW5—1914–20	3	¼	1¼	¼	68	3	¼	4	68	3	¼	4	156		38½
Rowe GPW3—1916–17, 1919–20	3	¼	1¼	¼	.....	.....	.....	.....	.....	.....	.....	.....	144		33
Sandow G–1—1918–20	3	¼	1	¼	20	2	¼	2	20	2	¼	2	96		34
Sandow CG–1½—1918–20	3	¼	1	¼	20	2	¼	2	20	2	¼	2	120		34
Sandow I–2—1918–20	3	¼	1	¼	60	3	¼	1	60	3	¼	1	132		32
Sandow J–2½—1918–20	3	¼	1¼	¼	13½	3½	¼	2	16	3½	¼	1	144		32
Sandow L–5—1918–20	3	¼	1¼	¼	24	4½	¼	2	24	4½	¼	2	144		37
Sandow M–3½—1918–20	3	¼	1¼	¼	18½	4	¼	2	18½	4	¼	2	144		37
Sanford 25–2½—1917–20	3	¼	1¼	1¼	51½	2¼	¼	2	51½	2½	¼	2	144		35
Sanford W35–3½—1917–20	3	¼	1¼	1¼	56	2½	¼	2	56	2½	¼	2	145		35
Sanford W50–5—1917–20	3	¼	1¼	1¼	69	3	¼	2	69	3	¼	2	145		35
Schacht 2	3	¼	1¼	.....	.....	8½	3½	¼	4	13½	3	¼	4	140	35¾
Schacht 2½	3	¼	1¼	.....	.....	8½	3½	¼	4	13½	3	¼	4	140	35¾
Schacht 3½	4	¼	1¼	.....	.....	8½	3½	¼	4	13½	3	¼	4	152	35¾
Schacht 5	4	¼	1¼	.....	.....	8½	3½	¼	4	15	4	⅛	4	152	35¾
Selden 1½A—1919–20	3	¼	1	1¼	11	3¼	¼	2	11	3⅛	.....	.....	114		34
Selden 2½A—1919–20	3	¼	1	1¼	13½	3½	¼	2	13½	3½	¼	2	134		34
Selden 3½A—1919–20	3	¼	1¼	1¼	15¾	3¾	¼	2	15¾	3¾	¼	2	153		37½
Selden 5A—1920	3	¼	1½	1¼	18	4	¼	2	18	4	¼	2	153		37½

Replacement Table—Continued

Name, Model, Tonnage and Year	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per Cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Service 220-1—1919-20	3	1/4	1 7/16	1 7/16	12	3 1/4	1/4	2	12	3 1/4	1/4	2	109 1/2	34
Service 31-1½—1919-20	4	1/4	1 7/16	1 7/16	12	3 1/4	1/4	2	12	3 1/4	1/4	2	121 1/2	34
Service 36-1½—1919-20	4	1/4	1 7/16	1 7/16	12	3 1/4	1/4	2	12	3 1/4	1/4	2	121 1/2	34
Service 51-2½—1919-20	4	1/4	1 7/16	1 7/16	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	131 1/2	34
Service 71-3½—1919-20	4	1/4	1 7/16	1 7/16	16	3 3/4	1/4	2	16	3 3/4	1/4	2	150 3/4	38
Service 76-3½—1919-20	4	1/4	1 7/16	1 7/16	16	3 3/4	1/4	2	16	3 3/4	1/4	2	145 3/4	38
Service 101-5—1919-20	4	1/4	1 7/16	1 7/16	18 1/2	4	1/4	2	18 1/2	4	1/4	2	145 3/4	38
Shaw M2—1918-20	...	...	1	1	49	2 1/2	1/4	2	45	2 1/2	1/4	2	60	43
Shaw M4—1918-20	...	...	1	1	11	3	1/4	4	11	3	1/4	4	92	32
Signal F-1	3	1/4	1 7/16	1 7/16	12	3 1/4	1/4	2	12	3 1/4	1/4	2	120	34
Signal H-1½	3	1/4	1 7/16	1 7/16	12	3 1/4	1/4	2	12	3 1/4	1/4	2	120	34
Signal J-2½	3	1/4	1 7/16	1 7/16	13 1/2	3 1/2	1/4	2	13 1/2	3 1/2	1/4	2	126	34
Signal M 3½	3	1/4	1 7/16	1 7/16	16	3 3/4	1/4	2	16	3 3/4	1/4	2	168	38
Signal R-5	3	1/4	1 7/8	1 7/8	18	4	1/4	2	18	4	1/4	2	172	38
Standard I-K-1	3	1/4	1	1	10 7/8	3	1/4	4	10 7/8	3	1/4	4	120	32
Standard 76-2½	3	1/4	1 1/4	1 1/16	13 1/16	3 1/2	1/4	4	13 1/16	3 1/2	1/4	4	122	32
Standard 66-3½	3	1/4	1 1/4	1 1/16	15 5/16	3 3/4	1/4	4	15 5/16	3 3/4	1/4	4	144	38
Standard 86-5	3	1/4	1 1/4	1/4	17 11/16	4	1/4	4	17 11/16	4	1/4	4	144	38
Sterling 1½—1920	3	1/4	1 1/4	1/4	11 5/8	3 1/4	1/4	4	11 5/8	3 1/4	1/4	4	120	33 1/2
Sterling 2—1920	3	1/4	1 1/4	1/4	13 1/16	3 1/2	1/4	4	13 5/16	3 1/2	1/4	4	120	33 1/2
Sterling 2½—1920	3	1/4	1 1/4	1/4	13 1/16	3 1/2	1/4	4	13 5/16	3 1/2	1/4	4	138	34
Sterling 3½—1920	3	1/4	1 1/4	1/4	15 1/2	3 3/4	1/4	4	15 1/2	3 3/4	1/4	4	144	38
Sterling 5-Worm—1920	3	1/4	1 1/4	1/4	18	4	1/4	4	18	4	1/4	4	158	38
Sterling 5-Chain—1920	3	1/4	1 1/4	1/4	56 1/2	3 1/2	1/4	2	30	4	1/4	1	158	38
Sterling 7½—1920	3	1/4	1 1/4	1/4	56 1/2	3 1/2	1/4	2	30	4	1/4	1	158	38
Stewart M7-2—1918-20	3	1/4	.....	1 7/16	50 5/8	2	1/4	2	8	5	1/4	2	132 3/4	32
Stewart M12-1—1920	3	1/4	.....	1	41 5/8	2	1/4	2	22 3/4	2	1/4	1	99 1/2	32
Stewart M9-1½—1918-20	3	1/4	.....	1	48 1/2	2	1/4	2	8	5	1/4	2	119 1/4	32
Stewart M10-3½—1918-20	3	1/4	.....	1 3/16	60	3	1/4	2	8	5	1/4	2	139 3/4	32
Stewart M11-¾—1919-20	3	1/4	.....	7/8	41 3/4	2	1/4	2	22 3/4	2	1/4	1	77 1/2	32
Stewart M7X—1920	3	1/4	.....	1 7/16	50 5/8	2	1/4	2	8	5	1/4	2	132 3/4	32
Stewart M10X—1920	3	1/4	.....	1 5/8	60	3	1/4	2	8	5	1/4	2	138	32
Stoughton B-1½	4	1/4	1	1 5/8	19	2	1/4	4	19	2	1/4	4	116	34
Stoughton D-2	4	1/4	1 1/4	1 5/8	45	2	1/4	2	45	2	1/4	2	116	34
Stoughton E-2½	4	1/4	1 1/4	1 5/8	52	2 1/4	1/4	2	52	2 1/4	1/4	2	127	36
Success B-2½	...	...	1 3/4	1/4	55	2 1/4	1/4	1	55	2 1/4	1/4	1	132	32 1/4
Sullivan E-2—1916-20	3	1/4	1 7/16	1 7/16	13	3 1/2	1/4	8	13	3 1/2	1/4	8	144	34
Sullivan F-1½—1917-20	3	1/4	1 7/16	1 7/16	13	3 1/2	1/4	8	13	3 1/2	1/4	8	106	33 1/2
Superior D-1—1919-20	3	1/4	1 7/16	1 7/16	45	2 1/2	1/4	2	44	2 1/4	1/4	2	97 3/4	34
Superior E-2—1919-20	3	1/4	1 7/16	1 7/16	54	2 1/2	1/4	2	53 1/2	2 1/2	1/4	2	114	34
Texan A 38-¾	3	1/4	1	1 1/16	17 1/2	2 1/4	1/4	4	17 1/2	1 1/2	1/4	4	100	36
Tiffin GW-1½—1919-20	3	1/4	1 1/16	1 1/16	46	2	1/4	1	46	2	1/4	1	114	35
Tiffin MW-2½—1919-20	3	1/4	1 1/16	1 1/16	52	2 1/4	1/4	1	52	2 1/4	1/4	1	138	32 3/4
Tiffin PW-3½—1919-20	3	1/4	1 1/16	1 1/16	58	2 1/2	1/4	1	58	2 1/2	1/4	1	151	35 1/2
Tiffin TW-5—1919-20	3	1/4	1 1/16	1 1/16	58	3	1/4	1	58	2 1/2	1/4	1	156	38 1/2
Tiffin UW-6—1919-20	3	1/4	1 1/16	1 1/16	58	3	1/4	1	58	2 1/2	1/4	1	156	38 1/2
Titan 3½—1919	4	1/4	1 1/2	1 3/4	60	2 1/4	1/4	2	14	4 1/2	1/4	2	144	34
Titan 5-6—1918-20	4	1/4	1 1/2	1 3/4	90	2 1/4	1/4	2	14	4 1/2	1/4	2	144	34
Titan 2½—1920	4	1/4	1 1/4	1 1/4	54	2 1/4	1/4	2	26	4	1/4	1	144	32
Tower J-1½—1920	3	1/4	1 1/4	1 1/4	11 3/4	3 1/4	1/4	4	11 3/4	3 1/4	1/4	4	135 1/4	32 1/2
Tower H-2½—1919-20	3	1/4	1 1/4	1 1/4	13 1/16	3 1/2	1/4	4	13 1/16	3 1/2	1/4	4	138 3/4	32 1/2
Tower G-3½—1919-20	3	1/4	1 1/2	1 1/2	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	152 11/16	37
Traffic C-4000—1919-20	3	1/4	1	1/4	43 1/2	2 1/2	1/4	2	38	1 3/4	1/4	2	120 3/4	42
Transport 20-1	3	1/4	.....	.....	48 7/8	2	1/4	2	45 7/8	1 1/2	1/4	2	101	34
Transport 30-1½	3	1/4	.....	.....	48 7/8	2 1/2	1/4	2	45 7/8	1 1/2	1/4	2	117	34
Transport 50-2½	3	1/4	.....	.....	50 5/8	3	1/4	2	48 1/2	2 1/2	1/4	2	123	34
Transport 70-3½	4	1/4	.....	.....	11 1/2	4	1/4	2	58	2 1/2	1/4	2	150	36 1/2
Traylor B-1¼	...	...	1 1/4	1 1/4	50	2	1/4	2	50	2	1/4	2	117	34
Traylor C-2	...	...	1 1/4	1 1/2	50	2	1/4	2	50	2	1/4	2	120	34
Traylor D-3	...	...	1 1/4	1 1/2	56 1/2	2 1/4	1/4	2	56 1/2	2 1/4	1/4	2	142	34
Triangle AA-¾—1920	3	...	1	1	22	2 1/2	1/4	1	41	2	1/4	1	94	35
Triangle A-1½—1918-20	3	...	1	1	7	4	1/4	2	49	2	1/4	1	126	34
Triangle B-2½—1919-20	3	...	1 1/4	1 1/4	7	4	1/4	2	52	3	1/4	1	132	34
Triangle C-2—1920	3	...	1	1	7	4	1/4	2	52	3	1/4	1	129	34
Triumph 1½	...	...	.....	.....	.....	.....	.....	...	.....	.....	.....	...	120	.....
Twin City 2	3	1/4	1 1/4	2	50	3	1/4	1	48	2 1/2	1/4	1	132	33
Twin City 3½	4	1/4	1 1/4	2	15	3 3/4	1/4	2	15	3 3/4	1/4	2	156	36
Ultimate-2	4	1/4	1 7/16	1 5/8	45	2	1/4	2	45	2	1/4	2	120	32 3/4
Ultimate-3	4	1/4	1 7/16	1 5/8	51	2 1/4	1/4	2	51	2 1/4	1/4	2	131	32 3/4

Name, Model, Tonnage and Year	ENGINE				BRAKE LINING								FRAME	
	Piston Rings		Carburetor		Service				Emergency				Length	Width
	No. per cyl.	Width	Outlet Diameter	Inlet Diameter	Length	Width	Thickness	No. of Pieces	Length	Width	Thickness	No. of Pieces	Back of Driver's Seat	Over All
Union F-2½	3	1/4	1 1/4	1 3/4	65 1/2	3	1/4	1	49 1/2	2	1/4	1	133 1/2	32
Union H-4	3	1/4	1 1/4	1	57 1/2	3 1/2	1/4	1	33	4	1/4	1	157 1/2	34
United-1½	...	...	1	1 1/16	48	2	1/4	1	48	1 1/2	1/4	1	120	33
United-2½	...	...	1 1/4	1 1/16	49	3	1/4	1	49	2 1/2	1/4	1	Opt	33
United-3½	...	...	1 1/4	1 1/16	62	3	1/4	1	58	2 1/2	1/4	1	Opt	34
United-5	...	...	1 1/2	1 1/16	88 1/2	2 1/4	1/4	1	88 1/2	2 1/4	1/4	1	Opt	38
U.S.N.-1½	3	1/4	1	7/8	46 1/2	2	1/4	2	50 1/2	1 1/2	1/4	2	120	34
U.S.R.-2½-3	3	1/4	1 1/4	7/8	46	2 1/4	1/4	2	46	2 1/4	1/4	2	144	34
U.S.S.-3½-4	3	1/4	1 1/2	1/4	50	2 1/2	1/4	2	50	2 1/2	1/4	2	156	36
U.S.T.-5-6	3	1/4	1 1/2	1/4	62	3	1/4	4	33	4	1/4	1	168	36
Velie 46-1½—1919-20	3	1/4	1	1/4	54 1/4	2 1/2	1/4	2	52 1/16	2 1/4	1/4	2	120	31
Vim 29-1½	3	1/4	.....	7/8	14 1/2	1 1/2	1/4	4	14 1/2	1 1/2	1/4	4	64	30
Vim 30-1½	3	1/4	.....	7/8	14 1/2	1 1/2	1/4	4	14 1/2	1 1/2	1/4	4	83 1/2	30
Vim 31-1	4	1/4	1	.....	19	2	1/4	4	19	2	1/4	4	92	32
Vim 22-2	4	1/4	1	.....	44 1/2	2	1/4	2	44 1/2	2	1/4	2	121 1/4	34
Vim 23-3	5	1/4	1 1/4	.....	51 1/2	2 1/4	1/4	2	51 1/2	2 1/4	1/4	2	159 1/2	34
Walker M1½	...	...	.....	.....	43	2 1/4	1/4	2	14	1 3/4	1/4	4	87	32
Walker K1	...	...	.....	.....	45 1/2	2 1/2	1/4	2	16	2	1/4	4	96	32
Walker L2	...	...	.....	.....	53 1/4	2 1/2	1/4	2	19	2	1/4	4	120	32
Walker P3½	...	...	.....	.....	53 1/4	3	1/4	2	19 1/2	2 1/2	1/4	4	140	35
Walker N5	...	...	.....	.....	53 1/4	3	1/4	2	19 1/2	2 1/2	1/4	4	162	35
W. J.-B2½	4	1/4	1 1/4	1 1/4	13	3 1/2	1/4	4	13	3 1/2	1/4	4	136 1/2	32
Walter S-5	3	1/4	1 3/4	.....	15	5	1/4	4	57	2 1/2	1/4	2	150	36
Ward LaFrance 2B-2½—1920	3	1/4	.....	1 1/4	13 1/16	3 1/2	1/4	4	13 1/16	3 1/2	1/4	4	124	33
Ward LaFrance 4A-3½—1920	3	1/4	.....	1 1/2	15 5/8	3 3/4	1/4	4	15 5/8	3 3/4	1/4	4	169 1/2	37
Ward LaFrance 5A-5—1920	3	1/4	.....	1 1/2	17 11/16	4	1/4	4	17 11/16	4	1/4	4	217 1/2	37
Ward WS2	...	...	.....	.....	29	1 1/2	1/4	2	29	1 1/2	1/4	1	72	32 1/2
Ward WA	...	...	.....	.....	16	1 3/4	1/4	8	16	1 3/4	1/4	8	95	33 1/2
Ward WB	...	...	.....	.....	20	2	1/4	8	20	2	1/4	8	120	33 3/4
Ward WD	...	...	.....	.....	48 7/8	2 1/4	1/4	4	48 7/8	2 1/4	1/4	4	144	33 1/2
Ward WF	...	...	.....	.....	56 7/8	2 1/2	1/4	4	56 7/8	2 1/2	1/4	4	168	34 1/2
Ward WH	...	...	.....	.....	68 3/4	3	1/4	4	68 3/4	3	1/4	4	192	37
Watson B1½	...	...	1	.....	41	1 3/4	1/4	1	41	1 3/4	1/4	1	96	30
Watson N-3½	...	...	1 1/4	.....	62	2 1/2	1/4	1	47	2 1/2	1/4	1	147	37
Watson U-5	...	...	1 1/4	.....	15 1/2	3 3/4	1/4	4	15 1/2	3 3/4	1/4	4	.....	36
Wells 2	3	1/4	.....	1/4	54	2 1/2	5/8	2	51	2 1/2	5/8	2	120 1/4	34
White 15-¾	3	...	.....	.....	.....	.....	.....	...	.....	.....	.....	...	76 1/2	34
White 20-2	3	...	.....	.....	.....	.....	.....	...	.....	.....	.....	...	107 1/2	34
White 40-3	...	...	1	.....	.....	.....	.....	...	.....	.....	.....	...	157	42
White 45-5	...	...	1	.....	.....	.....	.....	...	.....	.....	.....	...	157	42
White Hickory H-1½—1920	3	1/4	1 1/4	1	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	116 1/4	32
White Hickory E-1—1920	3	1/4	1 1/4	1	11	3	1/4	4	11	3	1/4	4	92 1/4	32 1/2
White Hickory K-2½—1920	3	1/4	1 1/2	1 1/4	13 1/2	3 1/2	1/4	4	13 1/2	3 1/2	1/4	4	150	32
Wichita K-1—1915-20	3	1/4	1	1 1/16	19 1/2	2	1/4	2	19 1/2	2	1/4	2	127 1/2	30
Wichita L-1½—1916-20	3	1/4	1	1 1/16	49	2	1/4	2	49	2	1/4	2	127 1/2	30
Wichita M-2—1915-20	3	1/4	1	1 1/16	49	2	1/4	2	49	2	1/4	2	126 1/2	30
Wichita R-2½—1917-20	3	1/4	1	1 1/16	54	2 1/4	1/4	2	54	2 1/4	1/4	2	126 1/2	30
Wichita RX-2½—1919-20	4	1/4	1 1/4	1 1/4	54	2 1/4	1/4	2	54	2 1/4	1/4	2	130	30
Wichita O-3½—1915-20	4	1/4	1 1/4	1 1/4	56 1/2	2 1/2	1/4	2	56 1/2	2 1/2	1/4	2	152 1/2	36
Wichita S-5—1919-20	4	1/4	1 1/4	1 1/4	66	3	1/4	2	66	3	1/4	2	163 1/2	36
Wilcox AA-1—1920	3	1/4	1	.....	47 1/16	2 1/2	1/4	2	33 1/4	2 1/2	1/4	2	96	34
Wilcox B-1½—1919	3	1/4	1 1/4	.....	47 1/16	2 1/2	1/4	2	33 1/4	2 1/2	1/4	2	132	33
Wilcox C-2½—1919	3	1/4	1 1/4	.....	57 1/2	2 1/2	1/4	2	42 1/2	2 1/2	1/4	2	141	33
Wilcox E-3½—1920	3	1/4	1 1/4	.....	57 1/2	2 1/2	1/4	2	42 1/2	2 1/2	1/4	2	156	33
Wilcox F-5—1920	3	1/4	1 1/2	.....	69 5/8	3 1/2	1/4	2	52	3 1/2	1/4	2	148 1/2	36
Wilson 1½—1919-20	4	1/4	.....	1	39 1/2	1 3/4	1/4	2	39 1/2	1 3/4	1/4	2	120	33
Wilson 2½—1919-20	4	1/4	.....	1 1/4	13 3/4	3 1/2	1/4	4	13 3/4	3 1/2	1/4	4	126	33
Wilson 3½—1919-20	4	1/4	.....	1 1/2	16	3 3/4	1/4	4	16	3 3/4	1/4	4	147	38
Wilson 5—1919-20	4	1/4	.....	1 1/2	18	4	1/4	4	18	4	1/4	4	147	38 1/4
Winther 39-1½	3	1/4	1 1/4	.....	50	2 1/4	1/4	2	22 1/2	2 1/4	1/4	1	120	30
Winther 430-1½	3	1/4	1 1/4	.....	50	2 1/4	1/4	2	22 1/2	2 1/4	1/4	1	120	30
Winther 49-2	3	1/4	1 1/4	.....	52	3	1/4	2	50	2 1/4	1/4	2	144	33
Winther 70-3½	3	1/4	1 1/4	.....	62	3	1/4	2	60	2 1/2	1/4	2	156	33
Winther 109-5	3	1/4	1 1/2	.....	93	2 1/4	1/4	2	93	2 1/4	1/4	2	156	33
Winther 140-7	3	1/4	1 1/2	.....	93	2 1/4	1/4	2	93	2 1/4	1/4	2	156	33
Witt Will N-1½—1919-20	3	1/4	1 1/4	1 1/4	46	3 1/4	1/4	4	46	3 1/4	1/4	4	102	32
Witt Will P-2—1919-20	3	1/4	1 1/4	1 1/4	48	3 1/4	1/4	4	48	3 1/4	1/4	4	122	32
Wolverine C-1½—1918-20	3	1/4	1	1	41 1/2	2 1/2	1/4	2	41 1/2	1 3/4	1/4	2	120	34 1/2
Wolverine D-2—1920	3	1/4	1	1	51	3	1/4	2	46	2	1/4	2	132	34 1/2

KEY OF ABBREVIATIONS

Note: Numerals on This Page Correspond With Numerals at Head of Specification Columns on Pages Following

In All Specifications { O—Own / Op or Opt—Optional

Engine:
Beav—Beaver
Cont—Continental
GBS—Golden, Belknap & Swartz
Her—Hercules
Hin—Hinkley
HSp—Herschell-Spillman
1 LeR—Le Roi
Lib—Liberty
LMF—Light Mfg. & Fdy.
Lyco—Lycoming
Rut—Rutenber
Ster—Sterling
TC—Twin City
Vict—Victory
Wau—Waukesha
Wei.—Weidely
Wis—Wisconsin

Valve Arrangement:
2 H—Overhead
L—ELL-Head
T—TEE-Head
S—Sleeve

How Cooled:
3 A—Air
C—Centrifugal
G—Gear Pump
T—Thermo-Syphon

Radiator (Make):
BW—B & W
Brm—Brenem
Bus—Bush
Can—Candler
Chic—Chicago
EM—English-Mersick
Eur—Eureka
Fed—Fedders
Flex—Flexo
GO—G. & O.
Har—Harrison
4 Hoo—Hooven
Idl—Ideal
Jam—Jamestown
Kue—Kuenz
Liv—Livingston
Lng—Long
McC—McCord
May—Mayo
Per—Perfex
R-T—Rome-Turney
Spar—Spartan
Spec—Special
Spi—Spirex
Stan—Standard

Radiator (Type):
5 C—Cellular
H—Honeycomb
PT—Plain Tube
FIN—Fin Tube
ZZT—Zig Zag Tube

Lubrication:
6 FS—Force and Splash
F—Force Feed
S—Splash

Carburetor:
B&B—Ball & Ball
Bent—Bennett
Cart—Carter
Eag—Eagle
Ens—Ensign
Flch—Fletcher
Holl—Holley
John—Johnson
7 King—Kingston
Mar—Marvel
Mas—Master
Mill—Miller
Rayf—Rayfield
Strm—Stromberg
Shk—Shakespeare
Sheb—Schebler
Stew—Stewart
Till—Tillotson
Zen—Zenith

Fuel Feed:
8 G—Gravity
P—Pressure
V—Vacuum

Governor:
Con—Continental
Del—Delaney
Dup—Duplex
Hin—Hinkley
Mer—Merrill
9 McC—McCanna
Mon—Monarch
Phar—Pharo
Pier—Pierce
Rug—Ruggles
Sim—Simplex
Wau—Waukesha

Clutch (Make):
B. B.—Borg & Beck
B-Li.—Brown-Lipe
Covt.—Covert
Det.—Detlaff
10 Full.—Fuller
D. G.—Detroit Gear & Mach.
Hart—Hartford
M-E—Merchant & Evans
Munc.—Muncie
War.—Warner

Clutch (Type):
11 D—Disc
C—Cone
DP—Dry Plate
WP—Wet Plate
WD—Wet Disc
DD—Dry Disc
Fr—Friction

Ignition System:
Aer—Aero
AtK—Atwater-Kent
AuL—Auto-Lite
Bos—Bosch
Ber—Berling
Con—Connecticut
Del—Delco
Dix—Dixie
Eis—Eisemann
12 Exi—Exide
Kin—Kingston
KW—K. W. Ignition Co.
Lor—Louraine
NE—North East
POL—Prest-O-Lite
Rm—Remy
Sim—Simms
Spl—Splitdorf
Wag—Wagner
Wes—Westinghouse

Engine Starter:
AC—Allis-Chalmers
AL—Auto-Lite
Bj—Bijur
DL—Delco
13 Dy—Dyneto
GD—Gray & Davis
LN—Leece-Neville
NE—North East
RE—Remy
Wg—Wagner
USL—U. S. L.
W—Westinghouse

Gearset:
B-Li—Brown-Lipe
Cott—Cotta
Covt—Covert
D-Sea—Driggs-Seabury
Det—Detroit
14 Dun—Dundore
Durst—Durston
Full—Fuller
G-Le—Grant Lees
MM—Mechanics Mach. Co.
Munc—Muncie
Rock—Rockford
Warn—Warner

Location of Gearset:
A—Amidships
15 R—Rear
U—Unit with engine
J—Unit with jackshaft

Universal:
A-B—Easton Mch. Co.
Acm—Acme
Bear—Bearings Co.
Bld—Blood Brothers
Dit—Ditwiler
Flex—Flexite
Hart—Hartford
16 KB—Kinsler-Bennett
Mech—Mechanics
M-E—Merchant & Evans
Pet—Peters
Sned—Snead
Spic—Spicer
Ster—Sterling
Ther—Thermoid
UM—Universal Machine
UP—Universal Products

Springs:
Cham—Champion
Coop—Cooper
Det—Detroit
GC—Garden City
Hig—Higgins
IC—Iron City
Kal—Kalamazoo
Lah—Laher
Mar—Maremont
17 Math—Mather
Mer—Merrill
Nat—National
Per—Perfection
Row—Rowland
Shel—Sheldon
SP—Spring Perch
Stan—Stan-Par
Ster—Sterling
Tem—Temme
Tut—Tuthill
US—United States
Wis—Wisconsin

Final Drive:
B—Bevel Gear
C—Chain
18 I—Internal Gear
N—Concentric Spur
P—Spur
R—Double Reduction
S—Spiral Bevel
W—Worm

Rear Axle (Make):
Badg—Badger
Col—Columbia
Stan—Chicago
19 Cl—Clark
Emp—Empire
Hind—Hindley
Keno—Kenosha
Ken—Kennedy
Rock—Rockford
Russ—Russel
Sals—Salisbury
Sav—Savage
Shel—Sheldon
S-Par—Stan-Par
Thom—Thomson
Tim—Timken
Torb—Torbensen
W-M—Weston-Mott
US—United States
Walk—Walker
Wis—Wsconsin

Rear Axle (Type):
Flot—Floating
20 ½-Fl—Semi-Floating
¾-Fl—¾-Floating
D—Dead

Steering Gear:
CAS—C. A. S. Products Co.
Dit—Ditwiler
Gem—Gemmer
21 Jac—Jacox
Lav—Lavine
Ros—Ross
War—Warner
Woh—Wohlrab

Wheels:
Arc—Archibald
AuW—Auto Wheel
Bim—Bimel
Cla—Clark
Day—Dayton
Det—Detroit
E&O—Eberly & Oris
Hay—Haynes
Hoo—Hoopes Brothers
Jon—Jones
Kel—Kelsey
22 Mut—Mutual
Pru—Prudden
Roy—Royer
Rus—Russell
Sal—Salisbury
Sch—Schwartz
Smi—Smith
Sta—Stanwell
StM—St. Mary
Stn—Standard
Wal—Walker
Wan—Wayne
W-L—Waterhouse & Lester
Wes—Western Wheel Co

Rim Equipment:
Bak—Baker
Det—Detroit
23 Fir—Firestone
Gdy—Goodyear
Jax—Jaxon
Kel—Kelsey
Stn—Stanweld

Commercial Car Specifications—Corrected Monthly

The Specifications, Chassis Prices, Etc., Are Corrected Each Month From Data Supplied Direct by the Makers. GasolineTractor-Trucks and Electric Commercial Cars Will be Found at the End of Gasoline Commercial Cars

See Also Replacement Table in "Service and Repair Departments." Truck Frame Dimensions Are Included in Replacement Table

(Where prices are not given it is because we have been unable to get them from authoritative sources)

*An asterisk in front of the model name indicates that corrections have been made somewhere in the specifications since the previous month

Trade Name and Model	Chassis Price	ENGINE DETAILS: Make and Model Number 4 Cylinder unless otherwise noted	Bore and Stroke	N. A. C. C. Horsepower	Valve Arrange't	How Cooled	Radiator (Make)	Radiator (Type)	Lubrication	Carburetor	Fuel Feed	Governor (Make)	Clutch (Make)	Clutch (Type)	Ignition System	Engine Starter	GEARSET: Make	Location	Speeds	Universal (Make)	Springs (Make)	REAR AXLE: Final Drive	Make	Type	Total Gear Reduction in High	Total Gear Reduction in Low	Steering Gear (Make)	TIRES, WHEELS, RIMS: *Pneumatic †Dual Front	Rear	Wheels (Make)	Rim Equipment	Chassis Weight	Wheelbase	Pr. Cent of Weight on Rear Wheels
	1			2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	19	20			21			22	23			
1000 Pounds																																		
*Dodge	1085	Own	3 1/16x4 1/2	24	L	C	McC	PT	FS	Stew	V	.....	Own	DD	Own	NE	Own	U	3	Own	....	S	Own	Flot	4.1	19.4	Own	33x4	33x4	Kel	Kel	1990	114	41
Ellsworth 25A	.....	Lyco	3 1/4 x5	16.9	L	T	.....	PT	S	Cart	G	.....	B.B.	.....	Con	AL	G-Le	U	3	.....	Shel	B	.....	.....	4.7	16.	.....	30x3 1/2*	30x3 1/2*	Sal	Det	2100	108	70
Elmira	.....	LeR 2C	3 1/16x4 1/2	15.6	L	T	H	FS	Holl	.....	.....	.....	.....	DD	Opt	.....	Own	...	3	Ther	Own	B	.....	1/2 Fl	3.6	.....	Own	28x3 1/2*	28x3 1/2*	.....	.....	.....	104	65
*Seneca	.....	LeR	3 1/16x4 1/2	15.6	L	T	Kue	C	S	Sheb	V	.....	B.B.	D	Con	AC	Warn	U	3	UM	Math	B	Peru	Flot	4.5	7.21	Dit	30x3 1/2*	30x3 1/2*	Day	Jax	1700	108	80
Vim 29	1355	Own	3 1/16x4 1/2	15.6	L	T	McC	PT	FS	Zen	G	.....	B.B.	DD	Wes	W	.....	U	3	Spic	Shel	W	Shel	.....	5.5	.....	CAS	31x4*	31x4*	Hoo	Fir	2175	108	....
Vim 30	1550	Own	3 1/16x4 1/2	15.6	L	T	McC	PT	FS	Zen	G	.....	.....	DD	Wes	W	.....	U	3	Spic	Shel	W	Shel	.....	5.5	.....	CAS	32x4 1/2*	32x4 1/2*	Hoo	Fir	2290	127	....
1500 Pounds																																		
Bethlehem K	1695	Own-K	3 1/16x5	19.6	L	T	Liv	.....	F	Zen	G	.....	B.B.	DD	Bos	GD	Det	U	3	Spic	Math	S	S-Par	.....	5.9	18.9	Ross	34x4 1/2	35x5	Wan	Fir	2660	125	65
G. M. C. 16	.....	Cont N-3/4	3 3/4 x5	22.5	L	C	McC	.....	S	Mar	G	Mon	Covt	.....	Eis	.....	Own	U	3	Um	Opt	B	Own	.....	6.	21.9	Jac	35x5*	35x5*	.....	Bak	2940	132	67
H. R. L.-L	2400	H-Sp 7000	3 1/2 x5	19.6	L	T	Fed	Fin	F	Zen	G	.....	Own	DP	Bos	GD	Covt	U	3	Spic	Shel	W	Wis	1/2 Fl	6.2	22.	Ross	34x4 1/2*	35x5*	Sch	.....	3300	134	....
International H	1850	Own-H	3 1/16x5 1/4	19.6	L	C	Own	Fin	FS	Holl	G	Own	Own	DP	Bos	Own	Own	A	3	Own	.....	I	Own	D	7.	25.	Own	36x3 1/2	36x3 1/2	Own	.....	2800	115	50
Kearns 3/4	1550	L. M. F.-H	3 1/4 x4 1/2	16.9	...	T	Own	H	FS	Zen	...	Mon	B.B.	DD	Ber	Dy	G-Le	U	3	M-E	.....	I	Torb	D	.....	.....	Lav	32x4 1/2*	32x4 1/2*	.....	.....	2000	118	70
Marshall	.....	Lyco	3 1/4 x5	16.9	...	T	.....	C	.....	.....	.....	.....	Hart	.....	.....	.....	.....	U	3	.....	.....	.....	.....	Flot	.....	.....	.....	30x3 1/2	30x3 1/2	.....	Fir	.....	112	....
*Oldsmobile	1500	Own-FB	3 11/16x5 1/4	21.7	H	G	Own	C	FS	Zen	V	.....	.....	C	Rm	AL	.....	U	3	Spic	.....	I	Torb	D	6.5	38.87	Jac	35x5	35x5	AuW	Jax	2580	128	73
Rainier R11	2150	Cont-N	3 1/2 x5	19.6	L	T	Har	H	...	Zen	V	Mon	B-Li	DD	Sim	.....	B-Li	...	3	Hart	Per	W	Tim	.....	7.2	23.9	Lav	35x5*	35x5*	Sch	Fir	2350	125	80
Shaw M-2	1975	Cont N-3/4	3 3/4 x5	22.5	L	T	.....	PT	FS	Zen	G	.....	B-Li	.....	Bos	.....	B-Li	U	3	Spic	Math	B	Tim	.....	4.9	16.31	Gem	32x4*	32x4*	Stn	Fir	2400	116	65
*Stewart 11	1450	LeR-2C	3 1/16x4 1/2	15.6	...	T	Bus	PT	FS	Zen	G	.....	B.B.	DP	Eis	Dy	Durs	U	3	Hart	Det	I	Cl	.....	6.6	19.8	CAS	32x4	32x4	Wan	Fir	2190	110	66.7
Texan	1495	Lyco-K	3 1/2 x5	19.6	L	T	Har	C	FS	Cart	V	.....	B.B.	DD	Con	Bj	G-Le	U	3	UP	Mar	B	Peru	Flot	4.2	12.6	CAS	33x4	33x4	Stn	Fir	2500	112	60
*Triangle AA	1600	H-Sp	3 1/4 x5	16.9	L	T	Per	ZZT	FS	Strm	G	.....	Full	DD	NE	NE	Full	U	3	UP	Det	I	Cl	.....	6.1	18.1	Gem	35x5*	35x5*	Hay	Fir	2600	115	60
*Watson B	.....	Wau BUX	3 3/4 x5 1/4	22.5	L	P	GO	C	S	John	G	Wau	B-Li	D	Con	D	B-Li	U	3	M-E	Shel	W	Emp	1/2 Fl	6.2	20.7	Lav	34x4 1/2*	34x4 1/2*	.....	.....	2900	128	....
White 15	2400	Own	3 3/4 x5 1/2	22.5	L	C	.....	C	FS	Own	G	.....	Own	D	....	.....	.....	A	4	Own	.....	B	Own	1/2 Fl	.....	.....	Own	34x4 1/2*	34x4 1/2*	.....	Fir	2960	133	....
1 Ton																																		
*Acason R	.....	Wau B.U.X.	3 3/4 x5 1/4	22.5	L	P	Can	C	S	Sheb	V	Wau	Full	.....	Eis	.....	Full	U	3	Bld	Det	W	Tim	.....	8.2	33.1	Ros	36x3 1/2 †	36x5	Bim	Opt	3650	142	....
Acme B	2175	Cont N	3 3/4 x5	22.5	L	T	GO	C	FS	Rayf	V	Dup	B.B.	DP	Eis	GD	Cott	U	3	Bld	Det	W	Tim	1/2 Fl	7.2	28.8	Ros	34x3 1/2	34x5	Bim	.....	3750	130	50
All American 1	1795	H-Sp 7000	3 1/2 x5	19.6	L	T	Stan	T	FS	Strm	G	Pier	B.B.	DP	Sim	Dy	Cott	...	3	Hart	Det	I	Torb	D	8.1	18.1	Lav	33x4*	32x4	Stn	Gdy	2600	130	75
Apex C	1745	Buda R.U	3 3/4 x5 1/2	22.5	L	T	GO	.....	F	Strm	V	.....	Full	.....	AuL	Op	Full	U	3	UP	Det	I	Torb	D	6.5	19.5	Lav	33x4*	32x3 1/2	.....	Fir	2870	130	70
*Armleder 20	.....	Buda CTU	3 3/4 x5 1/4	22.5	L	P	Lng	Fin	F	Zen	V	.....	Full	DD	Bos	W	Full	U	3	Spic	Math	W	Timk	Flot	7.25	29	Ros	34x3 1/2	34x5	StM	.....	3950	148	80
Atlas 21	.....	Lyco	3 1/2 x5	19.6	L	T	Own	H	S	Strm	...	.....	B.B.	DD	AtK	Wg	Own	...	3	Ster	Row	B	Own	.....	.....	.....	CAS	32x4 1/2*	32x4 1/2*	.....	.....	2650	130	70
Beck Hawkeye A	1950	H-Sp N-3/4	3 3/4 x5	22.5	L	T	Har	C	S	Strm	G	Pier	Full	DD	Bos	.....	Full	...	3	Bld	Hig	I	Cl	D	6.1	20.51	Lav	35x5*	35x5*	Hay	Fir	2800	124	75
Belmont	.....	GBS-SMG	3 3/4 x4 1/4	22.5	L	T	GO	.....	S	Zen	G	.....	B.B.	.....	Con	Dy	.....	U	3	Ster	.....	B	.....	3/4 Fl	5.2	15.75	Lav	31x4*	31x4*	E-O	Stn	2000	113	60
Bessemer	.....	Cont N	3 1/2 x5	19.6	L	T	.....	C	FS	Strm	G	.....	Full	DD	Bos	.....	Full	U	3	Arv	Per	I	Torb	D	7.1	20.25	Ros	34x3 1/2	34x4	Sch	Fir	2910	124	57
Bethehem K	1695	Own K	3 1/2 x5	19.6	L	T	Liv	C	F	Zen	G	.....	B.B.	DP	Bos	GD	Det	U	3	Spic	Math	I	Col	3/4 Fl	6.8	18.75	Ros	34x4 1/2	35x5	Wan	.....	2715	125	....
Birch 1	1595	Vict	3 1/2 x5	19.6	I	T	Chic	PT	FS	Strm	G	.....	Full	DD	Con	.....	Full	U	3	UM	.....	I	Cl	D	.....	.....	Lav	32x3 1/2	32x4	.....	.....	3200	132	....
Chevrolet T	1325	Own	3 11/16x5 1/4	21.7	H	C	Har	.....	FS	Zen	...	Mon	.....	C	Rm	AL	Warn	...	3	Arv	.....	W	.....	1/2 Fl	.....	.....	War	33x4*	35x5*	.....	.....	.....	125	....
*Clydesdale 32X	2375	Own	3 3/4 x5 1/8	22.5	L	T	Own	PT	S	Strm	G	Own	B-Li	DD	Bos	.....	B-Li	U	3	Spic	Per	W	S-Par	1/2 Fl	7.5	24.1	Ros	34x3 1/2	34x5	.....	.....	3450	149	72
Collier 18	.....	Cont N	3 1/2 x5	19.6	T	C	Lng	PT	S	Zen	V	Mon	Full	DP	Eis	.....	Full	U	3	.....	Math	W	Timk	.....	7.75	31	Ros	34x4	34x5	Bim	Fir	.....	140	70
Columbia F	1850	Cont N	3 3/4 x5	22.5	L	P	Lng	Fin	FS	Shk	G	Pier	B.B.	DD	Dix	.....	Covt	U	3	Spic	Per	I	Russ	D	7.5	21.1	Own	34x3 1/2	34x5	StM	Fir	3000	125	70
*Commerce E	1990	Cont N	3 3/4 x5	22.5	L	T	Lng	Fin	S	Zen	V	.....	D.G.	C	Eis	.....	Det	U	3	Spic	Det	I	Torb	.....	7.1	22.9	Jac	35x5	35x5	Bim	Fir	2900	126	80
Conestoga 20	.....	Cont N	3 1/2 x5	19.6	L	T	EM	ZZT	S	Strm	G	.....	Full	DD	Sim	.....	Full	U	3	Ster	Shel	W	Wis	.....	7.7	23.1	Ros	34x3 1/2	34x5	E-O	Stn	3300	128	90
Corbitt E	2400	Cont N-3/4	3 3/4 x5	22.5	L	T	MeC	Fin	FS	Strm	V	Sim	Full	DD	Eis	.....	Full	U	3	Hart	Shel	W	Shel	1/2 Fl	6.5	19.5	Ros	34x3 1/2	34x4	Fim	Fir	3890	130	75
*Day Elder A	2100	Cont N-3/4	3 3/4 x5	22.5	L	T	Bus	Fin	FS	Zen	G	.....	Covt	D	Eis	.....	Covt	U	3	Hart	IC	W	Shel	1/2 Fl	7.8	28.35	Gem	34x3 1/2	34x4	Jon	Fir	3250	128	70
*Denby 12	2400	Cont N-3/4	3 3/4 x5	22.5	L	T	Lng	PT	FS	Strm	G	Mon	Full	DD	Eis	.....	Full	U	3	UP	Det	I	Russ	D	8.2	26.4	Ros	35x5	36x6	Hay	.....	3220	124	73
Diehl A	1750	Cont N	3 1/2 x5	19.6	...	T	.....	H	FS	Zen	G	.....	B.B.	.....	Sim	.....	Durs	...	3	KB	Mar	I	Torb	D	5.3	.....	Jac	34x4 1/2*	35x5*	Sch	Fir	2400	115	90
Famous B-10	1995	Cont N	3 1/2 x5	19.6	L	T	Chic	PT	S	Strm	V	Mon	Full	DD	Eis	.....	Full	U	3	Bear	Det	I	Cl	D	7.1	21.1	Ros	36x3 1/2	36x4	Bim	Fir	3000	120	75
Federal SD	2600	Cont J-4	3 3/4 x5	22.5	L	C	Own	.....	F	Zen	V	Phar	B.B.	DD	Eis	.....	Own	A	3	Pet	Math	W	Timk	.....	6.25	20.6	Gem	35x5*	36x6*	Det	Det	3600	132	65
*Ford T	600	Own	3 3/4 x4	22.5	L	C	Own	PT	S	Holl	G	.....	Own	DP	Own	.....	Own	U	2	Own	Own	W	Own	1/2 Fl	7.25	19.9	Own	30x3 1/2*	32x4 1/2	.....	.....	1500	124	50
Forschler A	2100	Cont N	3 1/2 x5	19.6	L	T	EM	.....	FS	Zen	...	Dup	Full	.....	Bos	Op	Full	...	3	Hart	Own	W	Shel	.....	.....	.....	.....	36x3	36x4	.....	.....	3450	120	....
*Gary F	2100	Buda WU	3 3/4 x5	22.5	...	C	Chic	Fin	F	Mas	G	Pier	Full	DD	Eis	.....	Full	U	3	Bld	Det	W	Timk	.....	7.2	21.6	Ros	36x3 1/2	36x4	Pru	Gdy	3200	130	....
Giant 15	2425	Cont N	3 3/4 x5	22.5	L	T	Idl	.....	FS	Sheb	G	.....	B-Li	DD	Eis	.....	B-Li	U	3	Spic	Math	W	Shel	.....	7.8	24.97	Jac	34x3 1/2	34x5	Wan	.....	2950	138	94
*G. M. C. 16	.....	Cont N-3/4	3 3/4 x5	22.5	L	C	McC	.....	S	Mar	G	Mon	Own	DP	Eis	.....	Own	U	3	UM	.....	B	Own	.....	6.	21.9	.....	35x5*	35x5*	.....	.....	2940	132	67
Hahn J-4	.....	Cont J4-	3 3/4 x5	22.5	L	C	Own	PT	F	Strm	G	.....	.....	DD	Eis	.....	B-Li	...	3	Spic	.....	W	Shel	.....	6.1	.....	.....	36x3 1/2	36x5	.....	Bak	3200	.....	....
Higrade A18	2100	Cont N	3 1/2 x5	19.6	L	T	Per	PT	FS	Zen	V	Dup	Full	DD	Sim	AL	Full	U	3	Bld	Per	W	Shel	.....	..7	22.75	Lav	35x5	35x5	Det	Fir	2700	115	66
Hoover 15B	.....	Cont N	3 1/2 x5	19.6	L	G	Can	.....	F	Sheb	V	.....	Full	.....	Dix	.....	Full	U	3	Acm	Shel	W	Shel	.....	6.2	18.6	Lav	32x4	33x4 1/2	E-O	Fir	2425	120	....
*Independent F (Ohio)	.....	Cont N	3 3/4 x5	22.5	L	G	Lng	PT	F	Sheb	G	Pier	Full	DP	Eis	.....	Full	U	3	Ster	Math	W	Wis	.....	8.2	33.1	Ros	36x3 1/2	36x5	.....	.....	3400	851	85
International F	2050	Own F	3 1/2 x5 1/4	19.6	L	C	Own	Fin	FS	Holl	G	Own	Own	DP	Bos	Own	Own	A	3	Own	.....	I	Own	D	8.	26.5	Own	36x3 1/2	36x4	Own	.....	3000	128	50
*Kleiber AA	2600	Cont C-4	4 1/4 x5 1/4	27.2	L	C	Per	C	...	Strm	G	Pier	.....	DD	Bos	.....	B-Li	U	3	Spic	.....	W	Timk	3/4 Fl	7.75	31.	Ros	34x3 1/2	34x5	W-L	.....	4200	130	75
Lone Star 9	.....	Vict	3 1/2 x5	19.6	I	T	Chic	PT	S	Strm	V	.....	Full	.....	Con	.....	Full	A	3	Ther	.....	I	Keno	D	...	.....	Lav	34x4 1/2*	34x4	.....	.....	3200	134	....

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Trade Name and Model	Chassis Price	ENGINE DETAILS: Make and Model Number 4 Cylinder unless otherwise noted	Bore and Stroke	N. A. C. C. Horsepower	Valve Arrange't	How Cooled	Radiator (Make)	Radiator (Type)	Lubrication	Carburetor	Fuel Feed	Governor (Make)	Clutch (Make)	Clutch (Type)	Ignition System	Engine Starter	GEARSET: Make	Location	Speeds	Universal (Make)	Springs (Make)	REAR AXLE: Final Drive	Make	Type	Total Gear Reduction in High	Total Gear Reduction in Low	Steering Gear (Make)	TIRES, WHEELS, RIMS: *Pneumatic †Dual Front	Rear	Wheels (Make)	Rim Equipment	Chassis Weight	Wheelbase	Pr. Cent of Weight on Rear Wheels
1½ Ton—Con'd		1			2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	19	20			21			22	23			
Hoover 20A	.....	Cont N	3½x5	19.6	L	G	Can	.....	F	Sheb	V	Pier	Full	.....	Dix	.....	Full	U	3	Arv	Shel	W	Shel	.....	7.8	23.4	Lav	36x4	34x5	E-O	Fir	3150	132	....
H.R.L.-R	3250	Hink	4 x5¼	25.6	L	C	Fed	Fin	F	Zen	G	Hin	B-Li	DP	Bos	GD	B-Li	U	4	Spic	Shel	W	Shel	D	7.75	30	Ros	36x4	36x7	Sch	.....	4560	144	....
*Huffman B	2075	Cont N	3¾x5	22.5	...	C	T	.....	C	F	Zen	G	Mon	Full	DD	Eis	.....	Full	U	3	.....	Per	I	Stan	D	8.6	.....	Lav	34x3½	36x6	Roy	Fir	3200	140	85
*Huffman C	1875	Buda WU	3¾x5½	22.5	...	C	T	.....	C	F	Zen	G	Mon	Full	DD	Eis	.....	Full	U	3	.....	Per	W	Torb	.....	12.2	.....	Lav	34x3½	36x6	Roy	Fir	3350	140	85
Hurlburt	2850	Buda ETU	4 x5½	25.6	L	C	Own	.....	FS	Flch	G	Dup	B-Li	.....	Eis	.....	B-Li	U	3	.....	Per	W	Emp	.....	.....	.....	Ros	34x4	34x5	Wan	.....	4300	148	85
Independent E (Iowa)	2040	Cont N	3¾x5	22.5	L	C	GC	PT	FS	Strm	V	.....	Full	DD	Bos	.....	Full	U	3	Bld	GC	I	Russ	D	8.2	.....	Lav	34x3½	34x5	StM	Fir	3550	135	75
International K	2400	Own-K	3½x5¼	19.6	L	C	Own	Fin	FS	Holl	G	Own	Own	DP	Bos	Own	Own	A	3	Own	.....	I	Own	D	9	30	Own	36x3½	36x5	Own	.....	3400	128	50
Jumbo 15	2850	Buda CTU	3¾x5¼	22.5	L	G	Own	PT	F	Zen	G	.....	Full	D	NE	NE	Full	U	3	Arv	Per	I	Cl	D	7.2	28.8	Jac	36x3½	36x5	.....	.....	4530	144	75
Kalamazoo G	.....	Cont J4	3¾x5	22.5	L	P	GO	PT	F	Strm	V	Pier	Full	D	Bos	Dy	Ful	A	4	Acm	Shel	W	Wis	.....	8.2	41	Ros	34x4	36x5	Bim	.....	5080	144	80
Kearns 1½	2100	H-Sp 7000	3½x5	19.6	...	T	Own	H	S	Zen	...	Pier	B.B.	.....	Ber	Dy	G-Le	U	3	ME	Math	I	Torb	D	6.5	.....	Lav	34x3½	34x6	Way	.....	3400	136	70
*Kelly-Springfield K31	3000	Own	3¾x5¼	22.5	L	C	Lng	Fin	F	Zen	G	Pier	Own	C	Eis	W	Covt	A	3	Spic	Per	C	Own	D	8.6	31.44	Gem	36x3½	36x6	StM	.....	4420	144	89
*Kelly-Springfield K34	3000	Own	3¾x5¼	22.5	L	C	Lng	Fin	F	Zen	G	Pier	B.B.	D	Eis	W	Covt	A	3	Own	Per	W	Shel	½Fl	8.6	31.78	Gem	36x3½	36x6	StM	.....	4670	144	89
Kissel General Utility	2775	Own	3⅞x5½	24.1	L	C	McC	Fin	S	Strm	V	Pier	War	C	Eis	.....	War	U	3	Spic	Mat	W	Shel	.....	7.8	28.5	Jac	36x3½	36x5	Pru	.....	3890	152	69
*Kleiber A	3100	Cont C4	4½x5¼	27.2	L	C	Per	C	...	Strm	G	.....	.....	WD	Bos	.....	B-Li	A	4	Spic	.....	W	Opt	¾Fl	7.75	37.51	Ros	36x3½	36x6	W-L	.....	5200	143	75
*Larrabee-Deyo U	2400	Cont N¾	3¾x5	22.5	L	C	Bus	Fin	S	Sheb	G	Sim	B-Li	DD	Bos	.....	B-Li	U	3	.....	Mer	W	Shel	½Fl	7.6	25.5	Ros	34x3½	34x5	Hoo	.....	3600	138	....
*Maccar L	2925	Cont C4	4½x5¼	27.2	L	C	Own	Fin	FS	Strm	G	Pier	B-Li	DD	Eis	.....	B-Li	U	3	Spic	Mer	W	Timk	½Fl	7	23.52	Ros	36x4	36x6	Sch	Fir	4300	150	70
*Mack AB	3000	Own	4 x5	25.6	L	C	Own	C	S	Zen	G	Own	B-Li	DD	Aer	.....	B-Li	U	4	Bld	Mer	C	Own	D	6.9	28.01	Own	36x4	36x3½†	Sch	.....	4800	Op	68
Mack AB	3000	Own	4 x5	25.6	L	C	Own	C	S	Zen	G	Own	B-Li	DD	Aer	.....	B-Li	U	4	Spic	Mer	W	Timk	Flot	8.5	34.09	Own	36x4	36x3½†	Sch	.....	4900	Op	68
Master JW	2690	Buda OU	4½x5½	27.2	L	C	Chic	PT	S	Mas	G	McC	Full	DP	Eis	.....	Full	U	3	Spic	Det	W	Timk	½Fl	7.7	23.25	Ros	34x3½	34x5	Pru	.....	3900	142	78
*Maxwell	1637	Own	3⅝x4½	21.	L	C	Own	Pit	FS	.....	G	.....	Own	C	.....	.....	Own	U	3	Own	.....	W	Own	½Fl	7.25	34.4	Own	35x5	35x5	.....	.....	2385	124	50
Menominee H	2725	Wis EAU	4 x5	25.6	L	C	.....	Fin	FS	Strm	G	Mon	Det	DP	Eis	.....	Cott	U	3	Spic	Tut	W	Wis	.....	8.25	30.36	Ros	36x3½	36x5	Stn	Fir	.....	144	80
Moreland 20B	3125	Cont C2	4½x5¼	27.2	L	C	Own	C	FS	Mas	G	.....	Own	DD	Dix	.....	Own	A	4	Ther	US	W	Timk	.....	7	33.88	Ros	36x3½	36x6	Smi	.....	4150	126	....
Napoleon 11	1860	Vict	3½x5	19.6	H	C	Own	PT	F	Sheb	G	.....	Full	D	Con	AL	Full	U	3	Bld	Math	I	Torb	D	8	24	Lav	35x5*	36x6*	.....	Fir	3450	133	65
Nelson-LeMoon F1½	.....	Cont C4	4½x5¼	27.2	L	C	Chic	Fin	S	Strm	G	Pier	B-Li	DD	Bos	W	B-Li	U	3	Own	Tut	W	Timk	.....	7	.....	Lav	36x3½	36x6	Pru	Gdy	3400	Op	80
Noble B30	.....	Buda CTU	3¾x5¼	22.5	L	C	Chic	Fin	F	Strm	G	Pier	Full	DD	Eis	W	Full	U	3	M-E	Tut	W	Shel	½Fl	8.7	31.1	Lav	36x3½	36x6	Bim	Fir	4200	156	85
Norwalk	2025	Lyco K	3½x5	19.6	L	C	Stan	C	FS	Zen	V	.....	B.B.	.....	Del	Dy	G-Le	...	3	UM	SPar	W	Stan	.....	.....	.....	CAS	343½	34x5	.....	.....	1850	143	75
*O. K. 1½T	2675	Buda 1TU	4 x5½	25.6	L	G	R-T	PT	FS	Zen	V	Pier	Full	DD	Eis	.....	Full	U	3	Hart	Cham	W	Wis	.....	8.25	.....	Ros	36x3½	36x5	Bim	.....	.....	146	....
*Old Reliable A	2500	WisEU	4 x5	25.6	L	C	Chic	PT	FS	Strm	V	Mon	Full	DD	Bos	Op	Full	U	3	Spic	Shel	W	Shel	½Fl	7.7	24.94	Ros	34x3½	36x6	StM	.....	4150	138	90
*Oneida B9	2915	Oneida	4 x5¼	25.6	L	C	Own	C	F	Strm	...	Own	Own	DP	.....	.....	Own	A	3	Own	Math	W	Own	½Fl	7.75	33	.....	36x3½	36x6	.....	.....	5025	144	....
*Orleans A	3000	Her CU2	4 x5½	25.6	L	C	Chic	PT	F	Opt	...	Dup	Det	D	Opt	.....	Cott	...	3	Bld	Mar	W	Wis	.....	7	.....	Ros	36x3½	36x5	.....	.....	.....	144	80
Paige 52-19	2980	HinHAA400	4 x5¼	25.6	L	C	Own	Fin	F	Strm	V	Hink	B-Li	DD	Bos	Op	B-Li	A	4	Spic	Per	W	Timk	Flot	7.7	37.51	Ros	34x3½	34x5	Own	Fir	4000	140	85
Rainier R6	2450	Cont N	3½x5	19.6	L	T	Har	H	FS	Zen	V	Mon	.....	DP	Sim	.....	B-Li	U	3	Hart	Per	W	Shel	.....	7.8	25.97	Lav	34x3½	34x5	Sch	.....	3100	133	80
Reliance 10A	2500	Buda ITU	4 x5½	25.6	L	C	Bus	PT	FS	Strm	G	Pier	Full	DD	Eis	.....	Full	U	3	Pet	Shel	P	Badg	.....	6.6	19.08	Ros	36x3½	36x5	Bim	Gdy	4500	150	90
Republic 11X	2195	Cont N3¾	3¾x5	22.5	L	C	Own	C	FS	Strm	G	Rug	Full	DD	Bos	.....	Full	U	3	Hart	.....	I	Torb	D	8	23	Jac	34x4	34x6	Pru	Fir	3365	144	....
Reynolds 3A	.....	HinHAA400	4 x5¼	25.6	L	C	Lng	Fin	F	Strm	G	Hink	Covt	DD	Bos	W	Covt	A	4	Sned	Per	W	Shel	.....	6.5	30.62	Lav	36x6*	38x7*	Smi	.....	.....	144	75
*Rowe CW	3000	Wis CAU	3¾x5	22.5	L	C	Fed	H	F	Zen	G	Sim	B-Li	DD	Bos	.....	B-Li	U	4	Spic	Shel	W	Shel	½Fl	6.5	26	Ros	36x6*	36x6*	Hoo	.....	3800	133	69.1
Royal 1½	.....	Wis EAU	4 x5	25.6	L	C	.....	H	...	Strm	G	.....	.....	D	Bos	Op	Own	...	3	Own	Mer	W	Timk	.....	.....	.....	Ros	34x4	34x5	.....	.....	.....	128	67
Sandow CG	2590	Cont N¾	3¾x5	22.5	L	C	T	.....	Fin	FS	Strm	G	.....	.....	Eis	.....	Full	U	3	Spic	GC	W	Shel	.....	7.8	23	Ros	34x3½	34x5	StM	.....	3300	135	70
Schwartz BI	2385	Cont N¾	3¾x5	22.5	L	T	Fed	H	FS	Strm	G	Mon	B-Li	DD	Bos	.....	B-Li	U	3	M-E	Row	I	Torb	D	8	26.9	Ros	34x3½*	34x5	Sch	Fir	3750	140	....
Schwartz BW	2500	Buda CTU	3¾x5¼	22.5	L	C	Fed	.....	F	Strm	G	Mon	M-E	D	Bos	.....	Dun	U	3	M-E	Row	W	Thom	.....	8	26.9	Ros	36x6	34x5*	Sch	Fir	4000	140	....
Selden 1½A	2460	Cont N	3¾x5	22.5	L	C	Lng	.....	FS	Strm	G	Pier	B-Li	D	Eis	.....	B-Li	U	3	Spic	Per	W	Timk	½Fl	7	23.31	Lav	34x3½	34x5	Arc	.....	3400	137	75
*Service 31	2985	Buda IU	4 x5½	25.6	L	C	.....	Fin	F	Strm	G	Sim	B.B.	DP	Eis	.....	.....	A	4	Spic	.....	W	Timk	.....	7.75	37.5	Ros	36x3½	36x6	Bim	.....	4850	150	65
*Service 36	3415	Buda HU	4¼x5½	28.9	L	C	.....	Fin	F	Strm	G	Sim	B.B.	DP	Eis	.....	.....	A	4	Spic	.....	W	Timk	.....	7	33.8	Ros	35x5*	38x7*	Bim	.....	4900	150	65
Signal H	2925	Cont C4	4½x5¼	27.2	L	C	McC	Fin	FS	Strm	G	Pier	B-Li	DD	Eis	.....	B-Li	A	4	Spic	Det	W	Timk	½Fl	7.75	31	Ros	34x4	36x6	Hay	.....	4760	146	66
Southern 15	.....	Buda RU	3½x5⅛	19.6	L	C	.....	PT	S	Zen	...	.....	Full	DD	Bos	.....	Full	...	3	.....	Mat	W	Shel	.....	.....	.....	Ros	35x3½	35x5	.....	.....	.....	144	70
Sterling 1½	.....	Ster FU	4x5¾	25.6	L	C	Own	C	F	Rayf	V	Wau	B-Li	DD	Eis	.....	B-Li	U	4	Spic	Mat	W	Timk	½Fl	7	28	Ros	36x3½	36x5	Pru	.....	4720	142	91
*Stewart 9	2450	Cont N¾	3¾x5	22.5	...	C	Bus	PT	FS	Zen	G	.....	Full	DP	Eis	.....	Full	U	3	Hart	Det	I	Cl	.....	7.6	22.8	Gem	34x3½	34x5†	Wan	Fir	3440	140	70
*Stoughton B	2350	Wau BUX	3¾x5¼	22.5	L	C	Own	Fin	FS	Strm	G	Wau	B-Li	DD	Eis	.....	B-Li	U	3	Ther	Shel	W	Shel	½Fl	7.8	31.2	Lav	36x3½	36x5	Bim	Gdy	3800	140	71
Sullivan F	2350	Buda M	3¾x4½	22.5	L	C	T	.....	PT	F	Strm	G	.....	.....	C	Bos	.....	Covt	A	3	Hart	Mer	W	Timk	.....	8.5	31	Ros	36x3½	36x5	Wan	.....	3500	129	60
Texan TK 39	.....	Lyco K	3½x5	19.6	L	T	.....	C	FS	Cart	V	.....	B-Li	D	Con	Bj	G-Le	U	3	UP	.....	W	.....	½Fl	7.7	20.15	CAS	34x4	34x4	Bim	Fir	3200	130	60
*Tiffin GW	2695	Cont C4	4½x5¼	27.2	L	C	.....	Fin	FS	Sheb	G	Pier	Full	DP	Bos	.....	Full	U	3	Hart	Kal	W	Shel	.....	7.7	23.25	Ros	36x3½	36x5	Smi	.....	3750	129	....
Tower J1½	3000	Cont C4	4½x5¼	27.2	L	C	Own	PT	S	Zen	G	.....	Full	DP	Eis	.....	Full	U	3	Bld	Det	W	Timk	½Fl	7.25	29	Ros	35x5*	38x7*	Pru	Fir	4520	142	70
Transport 30	2250	Cont N	3¾x5	22.5	L	C	Spi	C	FS	Strm	G	Sim	Full	DD	Eis	.....	Full	U	3	Hart	Det	I	Cl	D	7.6	34	Jac	36x3½	36x5	.....	Fir	3450	140	70
Traylor C	2875	Buda ITU	4 x5½	25.6	L	G	GO	Fin	F	Zen	G	Pier	Covt	DD	Spl	.....	Covt	...	3	Hart	Mer	W	Shel	½Fl	7.75	.....	Ros	36x4	36x6	Sch	.....	4700	138	78
*Triangle A	2350	Wau BUX	3¾x5¼	22.5	L	C	Per	ZZT	FS	Strm	G	Wau	Full	DD	Eis	.....	Full	U	3	UP	Det	I	Cl	.....	7.1	21	Gem	34x3½	34x6	Roy	Fir	3750	144	60
Ultimate A	3200	Buda ITU	4 x5½	25.6	L	C	Own	Fin	F	Strm	G	Pier	B-Li	DD	Eis	W	B-Li	U	4	Spic	Shel	W	Shel	.....	6.5	.....	Ros	36x3½	36x4	Jon	Fir	4500	144	72
*United A–1½	2445	Buda CTU	3¾x5¼	22.5	L	C	Spi	PT	F	Strm	V	Sim	Full	DD	Eis	Op	Full	U	3	Bld	.....	I	Cl	D	7.6	.....	Ros	34x3½	34x5	Pru	Fir	.....	145	70
*U. S.-N	.....	Cont N	3¾x5	22.5	...	C	C	Lng	Fin	...	Strm	V	.....	B-Li	DD	Eis	Op	B-Li	U	3	Opt	Shel	I	Cl	D	7.6	25.3	Lav	36x3½	36x5	Sch	.....	3800	144	85
*U. S.-N. C	.....	Cont N	3¾x5	22.5	...	C	C	Lng	Fin	...	Strm	V	.....	B-Li	DD	Eis	Opt	B-Li	U	3	Opt	Shel	I	Cl	D	7.6	25.3	Lav	35x5*	38x7*	Sch	.....	3800	144	85
*U. S.-N. P	.....	Cont N	3¾x5	22.5	...	C	C	Lng	Fin	...	Strm	V	.....	B-Li	DD	Eis	Opt	B-Li	U	3	Opt	Shel	W	Shel	½Fl	7.8	25.97	Lav	35x5*	38x7*	Sch	.....	3900	144	85
*U. S.-N W	.....	Cont N	3¾x5	22.5	...	C	C	Lng	Fin	...	Strm	V	.....	B-Li	DD	Eis	Op	B-Li	U	3	Opt	Shel	W	Shel	½Fl	7.8	25.97	Lav	36x3½	36x5	Sch	.....	3900	144	85
*Velie 46	2200	Cont N¾	3¾x5	22.5	L	C	Own	PT	FS	Strm	G	Mon	B.B.	D	Ber	.....	Durs	U	3	Arv	Mat	I	Torb	D	8	37.4	Ros	36x3½	36x5	Bim	Gdy	3650	133	80
White Hickory H	.....	Cont N¾	3¾x5	22.5	L	C	Chic	Fin	FS	Strm	V	Sim	Full	DD	Eis	.....	Full	U	3	Arv	Shel	W	Timk	.....	8.5	25.5	Ros	36x3½	36x5	Bim	Fir	3750	144	76
Wichita L	2600	Wau BX	3¾x5¼	22.5	L	P	Per	C	F	Strm	G	Wau	Own	C	.....	.....	.....	A	4	Own	Det	W	Shel	½Fl	8.6	45.03	Ros	36x3½	36x5	Bim	Fir	4100	144	80
*Wilcox B	.....	Own	4½x5	28.9	L	P	.....	PT	S	Strm	G	Dup	Own	C	Bos	.....	Own	A	4	Own	Shel	W	Wis	½Fl	8.25	39.9	Own	36x4	36x5†	.....	.....	4600	135	75
Wilson F	2650	Own	3¾x5⅛	22.5	L	C	.....	Fin	FS	Mar	G	Pier	B.B.	DP	Eis	.....	Own	A	4	Ther	Per	W	Timk	.....	6	24	Ros	36x3½	36x5	..	.....	3800	136	75
Winther 39	2450	Wis CAU	3¾x5	22.5	L	P	Brm	Fin	F	Strm	G	.....	Full	DD	Eis	W	Full	U	3	Pet	Hart	I	Cl	D	7	21	Lav	34x3½	34x5	Own	Fir	3700	140	70
Winther 430	2850	Wis CAU	3¾x5	22.5	L	P	Brm	Fin	F	Strm	G	.....	Full	DD	Eis	W	Full	U	3	Pet	Hart	I	Cl	D	9	36	Lav	32x4	32x4	Own	Fir	4100	132	70
*Witt Will N	2150	Cont C4	3¾x5¼	22.5	H	G	.....	C	FS	Zen	G	Pier	B-Li	DD	Eis	.....	.....	U	3	Spic	.....	W	Timk	.....	7	30.36	Ros	36x3½	36x4	Arc	.....	3550	120	67
Wolverine C	.....	Cont N	3¾x5	22.5	L	T	Lng	Fin	FS	Strm	G	Mon	Full	DP	Eis	GD	Full	U	3	UP	Tut	I	Russ	D	8.2	32.8	Gem	34x3½	34x5	Hay	Gdy	3400	140	77
Wolverine D	.....	Cont N	3¾x5	22.5	L	T	Lng	F	FS	Strm	G	Mon	Full	DP	Eis	GD	Full	U	3	UP	Tut	I	Rus	D	10.2	40.8	Gem	34x4	34x7	.....	Gdy	4250	148	80
2 Ton																																		
*Acason H	.....	Wau CU	4¾x5¾	30.6	L	P	C	Can	C	FS	Sheb	V	Wau	Det	.....	Eis	.....	Cott	A	4	Bld	Det	W	Timk	.....	8.75	40.3	Ros	36x4	36x8	Smi	Opt	4354	150	....
Acme A	3050	Cont C4	4½x5¼	27.2	L	C	GO	Fin	FS	Rayf	V	Dup	B.B.	DP	Eis	.....	Cott	A	4	Bld	Det	W	Timk	Flot	8.5	44.2	Ros	36x4	36x7	Bim	.....	4840	148	50
Autocar F	2300	Own 2F	4¼x4½	18	...	L	C	Own	Fin	S	Strm	G	.....	Own	DP	.....	.....	Own	A	3	.....	.....	R	Own	Flot	8.3	33.2	Own	34x4	34x5	Hoo	.....	3430	97	65

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Trade Name and Model	Chassis Price	ENGINE DETAILS: Make and Model Number 4 Cylinder unless otherwise noted	Bore and Stroke	N. A. C. C. Horsepower	Valve Arrange't	How Cooled	Radiator (Make)	Radiator (Type)	Lubrication	Carburetor	Fuel Feed	Governor (Make)	Clutch (Make)	Clutch (Type)	Ignition System	Engine Starter	GEARSET: Make	Location	Speeds	Universal (Make)	Springs (Make)	REAR AXLE: Final Drive	Make	Type	Total Gear Reduction in High	Total Gear Reduction in Low	Steering Gear (Make)	TIRES, WHEELS, RIMS: *Pneumatic †Dual Front	Rear	Wheels (Make)	Rim Equipment	Chassis Weight	Wheelbase	Pr. Cent of Weight on Rear Wheels
2 Ton—Con'd		1		2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	19	20			21			22	23			
Winther 49	3250	Wis EAU	4 x5	25.6	L	G	Brm	Fin	F	Mas	V	.....	B.B.	DP	Eis	W	B-Li	A	4	Bld	Math	I	Cl	D	9	39	Ros	34x4	34x4	Own	.....	5300	150	80
*Witt Will P	3250	Cont C4	4 1/2x5 1/4	27.2	H	G	.....	C	FS	Zen	G	Pier	B-Li	DD	Eis	.....	.....	U	3	Spic	.....	W	Tim	65.60	7.75	.....	Ros	36x3 1/2	36x7	Arc	.....	4550	144	70
2½ Ton																																		
Ace 2½	3450	Buda HU	4 1/4 x5 1/2	28.9	L	C	Spi	.....	F	Sheb	G	Pier	B-Li	DP	AtK	W	Cott	A	4	M-E	Math	W	Timk	.....	8.50	34	Ros	36x6*	40x8*	Day	Gdy	5630	156	80
Aetna 125	3375	Wis UAU	4 1/4 x6	28.9	L	T	GO	PT	F	Zen	G	Pier	B.B.	P	Bos	.....	Cott	A	4	Spic	Shel	W	Shel	1/2 Fl	7.75	31	Ros	36x4	36x4†	.....	.....	4625	160	70
All American 2½	2395	HSp 7000	3 1/2 x5	19.6	L	T	.....	T	F	Strm	...	.....	Det	DP	Sim	.....	Cott	...	4	Hart	Per	I	.....	D	.....	..	Lav	34x4	34x6	.....	.....	Opt	Op	.....
American	3575	Wis	4 x6	25.6	L	G	GO	Fin	F	Strm	G	Pier	Det	D	Eis	.....	Covt	A	3	Acm	P	W	Wis	1/2 Fl	8.6	.....	Lav	36x4	34x4†	Smi	.....	5000	158	.....
*Apex E	2695	Buda HTU	4 1/4 x5 1/2	28.9	L	C	GO	.....	F	Strm	V	Dup	Full	.....	Eis	Op	Full	U	3	UP	Det	I	Torb	D	9	27	Lav	36x4	36x7	.....	Fir	4500	160	70
*Armleder HW	.....	Buda HTU	4 1/4 x5 1/2	28.9	L	P	Lng	Fin	F	Zen	G	.....	Full	DD	Bos	.....	Full	U	4	Spic	Math	W	Timk	Flot	9.25	44	Ros	36x4	36x7	StM	.....	4650	166	80
Atco A	.....	Bud HU	4 1/4 x5 1/2	28.9	L	C	Chic	PT	F	Strm	G	Pier	Full	D	Eis	.....	Full	A	4	Hart	Shel	W	Wis	.....	8.7	.....	Ros	36x4	36x7	Smi	.....	4900	150	.....
Atterbury 7CX LWB	3675	Cont C4	4 1/2 x5 1/4	27.2	L	C	Own	Fin	S	Zen	G	Mon	B-Li	DD	Ber	.....	B-Li	U	4	Spic	SP	W	Timk	Flot	9.25	37	Gem	36x4	36x4	Arc	Fir	5280	171	92.5
Atterbury 7CX STD	3575	Cont C4	4 1/2 x5 1/4	27.2	L	C	Own	Fin	S	Zen	G	Mon	B-Li	DD	Ber	.....	B-Li	U	4	Spic	SP	W	Timk	Flot	9.25	37	Gem	36x4	36x4†	Arc	Fir	5120	153	92.5
Available 2½	3475	Own	4 1/2 x5 1/4	27.2	L	C	Chic	Fin	FS	Strm	V	Pier	B-Li	DD	Bos	.....	B-Li	A	4	Spic	.....	W	Timk	Flot	8.66	34.66	Ros	36x4	36x8	Sch	.....	4750	152	90
Bell O	2750	Buda HU	4 1/4 x5 1/2	28.9	L	C	Chic	PT	F	Strm	V	Sim	B.B.	DP	Eis	.....	Det	U	3	UP	Det	Opt	Opt	Opt	8	38.4	Gem	34x5	34x7	Bim	Fir	4200	146	65
Bessemer J2	.....	Cont C4	4 1/2 x5 1/4	27.2	L	C	.....	C	FS	Strm	G	Pier	B.B.	DP	Bos	.....	B-Li	A	4	Arv	Per	I	Torb	D	8	32	Ros	36x4	36x4†	Sch	Fir	4600	158	67
Bethlehem H	2695	Own H	4 x5 1/4	25.6	L	T	GO	C	F	Zen	G	Pier	Full	DD	Bos	GD	Full	U	4	UP	Math	I	Russ	D	8.8	42.24	Lav	36x4	36x7	Smi	Fir	4500	144	85
Betz D2	.....	Buda HTU	4 1/4 x5 1/2	28.9	L	C	.....	.....	F	Strm	...	Pier	B-Li	.....	Bos	.....	B-Li	...	4	UM	Tut	W	Timk	Flot	.....	.....	Ros	36x4	36x7	.....	.....	4750	150	75
*Bridgeport 2½B	2850	Buda HTU	4 1/4 x5 1/2	28.9	L	G	Own	.....	FS	Strm	...	Pier	B.B.	D	Eis	.....	.....	U	4	Hart	.....	W	Shel	.....	8.25	.....	Ros	36x4	Opt	Arc	.....	5500	156	70
*Brinton F	3400	Cont C4	4 1/2 x5 1/4	27.2	L	C	Bus	Fin	F	Strm	G	Pier	B-Li	D	Bos	.....	B-Li	U	3	Spic	Tut	W	Timk	Flot	.....	33.6	Ros	36x4	36x6	Sch	.....	4600	150	.....
Brockway K4	3200	Cont C4	4 1/2 x5 1/4	27.2	L	C	Bus	PT	FS	Strm	G	Opt	B-Li	DD	Eis	.....	B-Li	A	4	Spic	Mer	W	Timk	.....	8.5	34.	Gem	36x4	36x7	Hoo	.....	4700	152	80
Capitol H 2½	3450	WisUAU	4 1/4 x6	28.9	L	C	GO	Fin	F	Strm	G	Sim	Det	DD	Bos	.....	Cott	U	4	Ther	Sp	W	Wis	1/2 Fl	8.66	45	Ros	36x4	36x8	Det	.....	5200	156	85
Capitol K2½	3850	Wis UAU	4 1/4 x6	28.9	L	C	GO	Fin	F	Strm	G	Sim	Det	DD	Bos	W	Cott	U	4	Ther	SP	W	Wis	1/2 Fl	7	36.4	Ros	36x6*	42x9*	Det	Fir	5100	156	85
Chicago C2½	3250	Her CU3	4 x5 1/2	25.6	L	C	.....	PT	F	Strm	G	Sim	B-Li	D	Bos	.....	B-Li	U	4	Pet	Math	W	Timk	Flot	8.5	34	Gem	36x4	36x7	Opt	Stn	4500	156	.....
*Clydesdale 65EC	3775	Own	4 1/2 x5 1/2	32.4	L	C	Own	PT	S	Strm	G	Own	B-Li	DD	Bos	.....	B-Li	A	4	Spic	Stan	W	Timk	Flot	8.5	34	Ross	36x4	36x8	Smi	.....	5100	163	73
Collier 22	.....	Cont C4	4 1/2 x5 1/4	27.2	T	G	Lng	PT	FS	Zen	V	Pier	Full	DP	Eis	.....	Full	U	4	.....	Math	W	Timk	.....	8.5	40.8	Ros	36x4	36x4†	Bim	Fir	5550	165	.....
Columbia G	2850	Hink HAA	4 x5 1/4	25.6	L	C	Lng	Fin	F	Strm	V	Hink	Det	DP	Dix	W	Cott	A	4	Spic	Per	I	Russ	D	9.5	48.8	Own	36x4	36x7	Det	Fir	4250	148	80
*Concord B	3400	Buda HTU	4 1/4 x5 1/2	28.9	L	C	Bus	Pt	S	Zen	G	Mon	B-Li	DP	Eis	.....	B-Li	U	4	Spic	Per	W	Timk	.....	8.5	34	Ros	36x4	36x4†	Arc	Fir	4600	150	70
Corbitt B	3650	Cont C4	4 1/2 x5 1/4	27.2	L	C	Lng	Fin	FS	Strm	V	Sim	B-Li	DD	Eis	.....	B-Li	U	4	Hart	Shel	W	Shel	1/2 Fl	8.7	35	Ros	36x4	36x7	Bim	Fir	5325	152	75
Dart M	3000	Buda HU	4 1/4 x5 1/2	28.9	L	C	Own	C	F	Zen	G	Pier	Full	DD	Eis	.....	Full	U	4	Spic	Per	W	Own	.....	8.5	40.8	Ros	36x4	36x7	Pru	.....	4800	150	80
*Day Elder C	3150	Buda HTU	4 1/4 x5 1/2	28.9	L	C	Bus	Fin	...	Zen	G	Mon	Covt	D	Eis	.....	Covt	U	4	Hart	IC	W	Shel	1/2 Fl	10.3	49	Gem	36x4	36x7	Jon	Fir	5000	150	70
DeKalb E2½	2600	Cont C4	4 1/2 x5 1/4	27.2	L	G	.....	PT	F	Mas	G	Co	Full	DD	Eis	.....	Full	U	3	KB	Math	W	.....	Flot	9.3	33	Ros	36x5	36x6	Hay	.....	4800	144	79
Dependable E	2950	Buda HTU	4 1/4 x5 1/2	28.9	L	C	Lng	Fin	F	Zen	V	Mon	Full	DD	Dix	AL	Full	A	4	Acm	Per	W	Wis	1/2 Fl	8.6	.....	Ros	36x4	36x7	Bim	Fir	5600	157	70
Doane 2½	.....	Wau R	4 1/4 x5 1/4	28.9	...	C	.....	C	S	Mas	G	Wau	.....	DD	Bos	.....	.....	U	3	.....	.....	C	Own	D	7.7	.....	Lav	36x5	36x7	.....	.....	5000	147	79
Erie 2½	.....	Buda HTU	4 1/4 x5 1/2	28.9	L	C	MeC	.....	FS	Strm	G	Pier	Full	D	Bos	.....	Full	A	4	Spic	Per	W	Shel	.....	.....	.....	Ros	34x4	36x6	Hoo	Fir	5400	150	80
*Fageol 3400	3900	Wau RU4R	4 3/8 x5 3/4	30.6	L	C	Spi	C	F	Zen	G	Wau	B-Li	DD	Dix	.....	Own	A	5	Spic	Math	W	Timk	Flot	5.6	59.5	Ros	34x4	36x7	Stn	.....	4600	144	80
*Gary J	3150	Buda HTU	4 1/4 x5 1/2	28.9	L	C	Chic	Fin	F	Mas	V	Mon	B.B.	.....	Bos	.....	Full	U	4	Spic	Det	W	Timk	.....	8.5	41	Ros	36x4	36x7	Pru	Gdy	4850	148	.....
Gersix K	3500	Buda HTU	4 1/4 x5 1/2	28.9	L	C	Idl	C	F	Strm	V	Mon	B.B.	.....	Bos	.....	Cott	U	3	Bld	Tut	W	Own	.....	9.6	39	Ros	36x4	36x7	Jon	.....	5200	150	75
Gramm-Bernstein 25	3875	Hink	4 1/4 x5 1/2	28.9	L	C	Own	Fin	F	Strm	V	Hink	Own	DD	Eis	NE	Own	A	4	Own	Per	W	S-Par	1/2 Fl	7.7	36.7	Ros	36x4	36x4†	Smi	Fir	6800	150	91.3
Hahn EE	.....	Cont E4	4 1/2	32.4	L	C	Own	Fin	F	Strm	G	Pier	.....	DD	Bos	.....	B-Li	...	3	Spic	.....	W	Timk	.....	7.7	.....	Ros	36x4	36x8	.....	.....	4800	145	65
*Harvey WFA	3300	Buda HU	4 1/4 x5 1/2	28.9	L	G	.....	ZZT	FS	Strm	G	Mon	B.B.	DP	Eis	.....	B-Li	A	4	Spic	Shel	W	Shel	.....	7.7	31	Ros	36x4	36x7	Sch	.....	5300	150	80
Hendrickson I	.....	Buda HU	4 1/4 x5 1/2	28.9	L	C	.....	.....	F	Strm	G	McC	.....	D	Dix	.....	Full	A	4	Ther	Tut	W	Timk	.....	7.7	37.2	Ros	36x4	36x7	Stn	.....	.....	Op	80
Hewitt Ludlow	.....	Buda HU	4 1/4 x5 1/2	28.9	...	C	.....	.....	F	Strm	...	.....	B.B.	.....	.....	.....	Cott	...	4	Spic	.....	W	Wis	.....	.....	.....	Ros	36x4	36x7	.....	.....	4800	150	.....
H. R. L., H	3650	Hink HAA	4 x5 1/4	25.6	L	C	Fed	Fin	F	Zen	G	Hink	B-Li	DP	Bos	GD	B-Li	U	4	Spic	Shel	W	Shel	.....	8.75	30.	Ros	36x4	36x4†	Sch	.....	5310	154	.....
Hurlburt 2½	3750	Buda FTU	4 1/4 x5 1/2	28.9	L	G	Own	.....	F	Flch	G	Dup	B-Li	.....	Eis	.....	B-Li	U	3	.....	Per	W	Own	.....	.....	.....	Ros	36x4	36x4	Wan	.....	5600	170	85
Independent H, (Ohio)	.....	Cont K4	4 1/2 x5 1/4	27.2	L	G	Lng	PT	F	Sheb	G	Pier	Full	DP	Eis	.....	Full	U	3	Spic	Math	W	Wis	.....	9.6	39	Ros	36x4	36x8	Day	.....	4600	148	85
*Indiana 25	3350	Own 38	4 1/2 x5 1/2	27.2	L	C	McC	Fin	F	Strm	G	Pier	B.B.	DD	Eis	.....	.....	A	4	Acm	Shel	W	Shel	1/2 Fl	7.75	39.5	Woh	36x4	36x8	Day	.....	5850	156	73
Jumbo 25	3450	Buda HU	4 1/4 x5 1/2	28.9	L	G	Own	PT	F	Zen	V	Dup	Full	D	NE	.....	Full	U	4	Arv	Per	I	Cl	D	9	43.2	Jac	36x4	36x7	Day	.....	5190	152	75
Kalamazoo H	.....	Wis TAU	4x6	25.6	L	G	GO	PT	F	Strm	V	Pier	Full	D	Bos	Dy	Full	A	4	Acm	Shel	W	Shel	.....	8.75	42.8	Ros	36x4	36x8	Smi	.....	6200	160	80
Kankakee 2½	3175	Cont 6 9N	3 1/2 x5 1/4	29.4	L	C	.....	H	FS	Zen	V	.....	War	DD	Del	DL	Warn	...	3	Acm	Tem	I	Russ	D	7.4	22.2	Ros	34x6*	40x8*	Bim	Gdy	4200	170	70
Karavan	.....	Buda X TU	4 1/4 x6	28.9	L	C	Fed	ZZT	F	Zen	G	Dup	B-Li	DD	Ber	.....	B-Li	A	4	Spic	Shel	W	Shel	.....	7.75	37.51	Ros	36x4	36x8	Smi	.....	5700	148	80
*Kelly Springfield K35	3500	Own	3 3/4 x5 1/4	22.5	L	C	Lng	Fin	F	Zen	G	Pier	Own	C	Eis	W	Covt	A	3	Own	Per	C	Own	D	10.6	35.04	Gem	36x4	36x4	StM	.....	5000	144	89
*Kelly Springfield K36	3500	Own	3 3/4 x5 1/4	22.5	L	C	Lng	Fin	F	Zen	G	Pier	Own	D	Eis	W	Covt	A	3	Spic	Per	W	Shel	1/2 Fl	10.3	34.04	Gem	36x4	36x4†	StM	.....	5145	144	89
Kimball C	3975	Wis UAU	4 1/4 x6	28.9	L	C	Flex	PT	F	Zen	V	Dup	B-Li	DP	Spl	W	B-Li	A	4	Spic	US	W	Shel	1/2 Fl	7.7	37.31	Ros	36x4	36x7	Smi	Fir	5100	Op	66
Kissel Freighter	3475	Own 50000*	4 1/4 x5 1/2	28.9	L	C	McC	.....	S	Strm	V	Pier	War	.....	Eis	.....	War	A	4	Spic	Mat	W	Timk	.....	8.5	42.5	Lav	36x4	36x7	Pru	.....	4910	168	76
*Kleiber B	4200	Cont E4	4 1/2 x5 1/2	32.4	L	C	RT	PT	...	Strm	G	Sim	.....	WD	Bos	.....	B-Li	A	4	Spic	.....	W	Opt	3/4 Fl	7.75	37.51	Ros	36x5	36x8	WL	.....	6000	160	75
Koehler M	3365	Her CU3	4 x5 1/2	25.6	L	C	Own	.....	F	Zen	G	Sim	B-Li	D	Eis	.....	B-Li	A	4	Spic	Math	W	Timk	.....	9.25	37	Lav	36x4	36x7	Wan	.....	5050	162	75
*Larrabee-Deyo K	3400	Cont C4	4 1/2 x5 1/4	27.2	L	C	Bus	Fin	S	Sheb	G	Sim	B-Li	DD	Bos	.....	B-Li	A	4	Opt	Mer	W	Shel	1/2 Fl	8.7	35	Ros	36x4	36x7	Hoo	.....	5700	176	.....
*L.M.C. 2-20	2950	Cont C2	4 1/2 x5 1/4	27.2	L	C	.....	Fin	S	Strm	P	Pier	B.B.	.....	Bos	.....	Det	A	4	Ther	Math	I	Russ	D	8.8	38.72	Lav	36x4†	36x4†	Bim	.....	4500	164	80
*Maccar H 2	3750	Cont E4	4 1/2 x5 1/2	32.4	L	C	Own	Fin	FS	Strm	G	Pier	B-Li	DD	Eis	.....	B-Li	U	4	Spic	Mer	W	Timk	Flot	7.75	31.08	Ros	36x4	36. 4†	Sch	Fir	5250	162	70
Master D	3540	Buda HU	4 1/4 x5 1/2	28.9	L	C	Chic	PT	FS	Mas	G	McC	Full	DP	Eis	.....	B-Li	U	4	Spic	Det	R	Walk	Flot	8	32	Ros	34x4	36x7	Wal	.....	4500	144	.....
Master DL	3640	Buda HU	4 1/4 x5 1/2	28.9	L	C	Chic	PT	FS	Mas	G	McC	Full	DP	Eis	.....	B-Li	U	4	Spic	Det	R	Walk	Flot	8	32	Ros	34x4	36x7	Wal	.....	4600	170	.....
Master W	3290	Buda HU	4 1/4 x5 1/2	28.9	L	C	Chic	PT	FS	Mas	G	McC	Full	DP	Eis	.....	B-Li	U	4	Spic	Det	W	Timk	Flot	8.5	34	Ros	34x4	36x7	Pru	.....	4500	144	76
Master WL	3390	Buda HU	4 1/4 x5 1/2	28.9	L	C	Chic	PT	FS	Mas	G	McC	Full	DP	Eis	.....	B-Li	U	4	Spic	Det	W	Timk	Flot	8.5	34	Ros	34x4	36x7	Pru	.....	4600	170	80
Moreland 20C	3900	Cont E4	4 1/2 x5 1/2	32.4	L	C	Own	C	FS	Mas	G	.....	Own	DD	Dix	.....	Own	A	4	Ther	US	W	Timk	.....	6.8	32.9	Ros	36x4	36x8	Smi	.....	5380	144	.....
Nelson & LeMoon F2½	.....	Cont C4	4 1/2 x5 1/4	27.2	L	C	Chic	Fin	S	Strm	G	Pier	B-Li	DD	Bos	W	B-Li	A	4	Own	Tut	W	Timk	.....	7.7	.....	Lav	36x4	36x7	Pru	Gdy	4100	Op	80
Netco H	3800	Cont E4	4 1/2 x5 1/2	32.4	L	C	RT	PT	S	Zen	G	.....	B-Li	DP	Eis	.....	B-Li	A	4	Hart	Per	W	Timk	Flot	7.75	39	Ros	36x4	36x8	Arc	Gdy	6500	168	75
Noble D50	.....	Buda HTU	4 1/4 x5 1/2	28.9	L	C	Chic	Fin	F	Strm	G	Pier	Full	DP	Eis	W	Full	A	4	M-E	Tut	W	Shel	1/2 Fl	8.7	42	Lav	36x4	36x8	Bim	Fir	5000	176	85
Oneida C2	2995	Cont C4	4 1/2 x5 1/4	27.2	L	C	.....	.....	FS	Rayf	G	Pier	B.B.	.....	Bos	.....	B-Li	U	4	Acm	Tut	W	Timk	.....	8.5	.....	Gem	36x4	36x7	Stn	.....	5600	160	70
*O. K. 2½ T	3450	Buda HTU	4 1/4 x5 1/2	28.9	L	G	RT	PT	FS	Zen	V	Pier	Full	DD	Eis	.....	Full	A	4	Hart	Cham	W	Wis	.....	8.66	.....	Ros	36x4	36x7	Bim	.....	.....	150	.....
*Old Reliable B	3600	Wis UAU	4 1/4 x6	28.9		C	Chic	PT	FS	Strm	V	Mon	Full	DD	Bos	.....	Full	A	4	Spic	Shel	W	Shel	1/2 Fl	8.25	37.2	Ros	34x4	36x4†	StM	.....	5850	166	70
Oneida C9	.....	Cont C4	4 1/4 x5 1/4	27.2	L	C	Chic	PT	F	Opt	...	Dup	Det	D	Opt	....	Cott	...	4	Bld	Mar	W	Wis	.....	8	.....	Ros	36x4	36x7	.....	.....	.....	160	80
*Orleans B	3535	Hin HA500	4 1/4 x5 1/2	28.9	L	C	Own	Fin	S	Strm	G	Sim	B-Li	DD	Bos	Op	B-Li	A	4	Spic	Per	W	Shel	1/2 Fl	8.7	42.35	Ros	36x4	36x8†	Day	Fir	5200	150	85
Paige 54-20	.....	Cont C4	4 1/2 x5 1/4	27.2	L	C	GC	Fin	F	Strm	V	Mon	B-Li	DP	Bos	.....	B-Li	U	4	Spic	IC	W	Shel	.....	8.7	35.8	Ros	36x5	36x7	Smi	.....	5500	160	67.5
Pittsburgh B	.....																																	

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Trade Name and Model	Chassis Price	ENGINE DETAILS: Make and Model Number 4 Cylinder unless otherwise noted	Bore and Stroke	N. A. C. C. Horsepower	Valve Arrange't	How Cooled	Radiator (Make)	Radiator (Type)	Lubrication	Carburetor	Fuel Feed	Governor (Make)	Clutch (Make)	Clutch (Type)	Ignition System	Engine Starter	GEARSET: Make	Location	Speeds	Universal (Make)	Springs (Make)	REAR AXLE: Final Drive	Make	Type	Total Gear Reduction in High	Total Gear Reduction in Low	Steering Gear (Make)	TIRES, WHEELS, RIMS: *Pneumatic †Dual: Front	Rear	Wheels (Make)	Rim Equipment	Chassis Weight	Wheelbase	Pr. Cent of Weight on Rear Wheels
3½ Ton—Con'd		1			2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	19	20			21				22	23			
Gramm-Bernstein 35	4775	Hink	4½x5½	32.4	L	C	Own	Fin	F	Strm	V	Hink	Own	DD	Eis	NE	Own	A	4	Own	Per	W	Stan	½Fl	8.7	50.6	Ros	36x5	40x5†	Smi	Fir	8350	156	91.7
Hahn F	.....	Cont E4	4½x5½	32.4	L	C	Own	PT	F	Strm	...	Pier	.....	DD	Bos	.....	B-Li	A	4	Spic	.....	W	Timk	.....	10	.....	Ros	36x5	36x5†	.....	.....	6600	Op	65
*Hal-Fur B	3250	Hin HA-500	4¼x5½	28.9	L	G	GO	PT	F	Strm	V	Hin	B.B.	P	Bos	W	B-Li	A	4	Pet	Per	W	Timk	Flot	6.8	37.5	Gem	35x5*	Opt	.....	Fir	5000	Gp	70
Hall 3½	4100	Cont E4	4½x5½	32.4	L	T	Own	PT	FS	Zen	G	Dup	B-Li	DP	Bos	.....	B-Li	A	..	Opt	Det	W	Timk	.....	10	.....	Gem	36x5	36x5†	Smi	.....	6825	Op	.....
*Harvey WHA	4300	Buda YU	4½x6	32.4	L	G	.....	Fin	FS	Strm	G	Mon	B.B.	.....	Eis	.....	B-Li	A	4	Spic	Shel	W	Shel	.....	8.7	42.35	Ros	36x5	36x5†	Smi	.....	7700	160	80
Hendrickson J	4200	Buda HTU	4¼x5½	28.9	L	C	.....	.....	F	Strm	G	McC	.....	D	Dix	.....	Full	A	4	Ther	Tut	W	Timk	.....	10	49.6	Ros	36x5	36x5...	Stn	.....	.....	Op	80
Hewitt-Ludlow	.....	Buda	4½x5½	32.4	...	...	.....	.....	...	Strm	...	.....	B.B.	.....	Bos	.....	Cott	...	4	Spic	.....	W	Wis	.....	.....	.....	Ros	36x5	36x5	.....	.....	6300	156	.....
Hurlburt	4590	Buda YTU	4½x6	32.4	L	C	Own	.....	FS	Flch	G	Dup	B-Li	D	Eis	.....	B-Li	A	4	Spic	Per	W	Own	Flot	8.7	41.91	Ros	36x5	36x5	.....	.....	6400	156	.....
Indiana 35	4150	Own 40	4⅜x5½	30.6	L	C	McC	Fin	F	Strm	G	Pier	B.B.	DD	Eis	.....	.....	A	4	Spic	Shel	W	Shel	½Fl	10.2	49.6	Ros	36x5	36x5	Wan	.....	6400	156	.....
International L	4500	Own L	4¼x5	28.9	H	T	Own	Fin	FS	Ens	G	Own	Own	DP	Dix	Own	Own	A	4	Own	.....	I	Own	D	11	53.25	Own	36x5	40x10	Own	.....	7500	160	50
Jackson B	4250	Cont E4	4½x5½	32.4	L	T	.....	Fin	FS	Strm	...	Pier	B.B.	DP	Eis	Dyu	Own	...	4	Spic	Per	B	Own	Flot	9.2	43.49	Ros	36x7	36x7	.....	.....	7400	150	65
*Jumbo 35	4550	Buda YU	4½x6	32.4	L	G	Own	PT	F	Zen	G	Sim	B-Li	D	Eis	.....	B-Li	U	4	Spic	Per	I	Cl	D	9	48.15	Jac	36x5	36x10	Day	.....	7510	165	75
*Kalamazoo K	.....	Wis UAU	4¼x6	28.9	L	G	GO	PT	F	Strm	V	Pier	Full	D	Bos	Dy	Full	A	4	Acm	Shel	W	Shel	.....	10.25	49.8	Ros	36x5	36x5†	Smi	.....	7500	160	80
Kelly-Springfield K40	4400	Own	4½x6½	32.4	T	C	Lng	Fin	F	Zen	G	Pier	Own	C	Eis	W	Covt	A	4	Own	Per	C	Own	D	10.4	31.6	Gem	36x5	40x5†	StM	.....	7730	150	93
Kelly-Springfield K-41	4650	Own	4½x6½	32.4	T	C	Lng	Fin	F	Zen	G	Pier	B.B.	D	Eis	W	Covt	A	4	Pet	Per	I	Cl	D	10	50.7	Gem	36x5	40x5	StM	.....	7900	156	90
Kelly-Springfield K-42	4650	Own	4½x6½	32.4	T	C	Lng	Fin	F	Zen	G	Pier	B.B.	D	Eis	W	Covt	A	4	Pet	Per	W	S-Par	½Fl	10.25	52	Gem	36x5	40x5	StM	.....	8500	156	90
*Kleiber C	4900	Cont E4	4½x5½	32.4	L	C	RT	PT	...	Strm	G	.....	.....	WD	Bos	.....	B-Li	A	4	Spic	.....	W	Timk	Flot	8.75	42.35	Ros	36x5	36x10	W-L	.....	7200	163	75
*Larrabee-Deyo L	4200	Cont E4	4½x5½	32.4	L	C	Bus	Fin	S	Sheb	G	Sim	B-Li	DD	Bos	.....	B-Li	A	4	Opt	Mer	W	Shel	½Fl	10	41	Ros	36x5	36x5†	Hoo	.....	6850	186	.....
*Maccar M2	4500	Wis VAU	4½x6	32.4	L	C	Own	Fin	FS	Strm	G	Pier	B-Li	DD	Eis	.....	B-Li	U	4	Spic	Mer	W	Timk	Flot	8.75	42.35	Ros	36x5	36x10	W-L	.....	7200	163	75
Mack AC	4950	Own AC	5 x6	40	L	C	Own	PT	S	Zen	G	Own	Own	DP	Aer	.....	Own	UJ	3	Spic	Mer	C	Own	D	8.49	27	Own	36x5	40x5†	Sch	.....	8070	Op	65
Master A	4190	Buda YTU	4½x6	32.4	L	C	Chic	PT	FS	Mas	G	Pier	B-Li	DP	Eis	.....	B-Li	A	4	Spic	Det	W	Timk	Flot	10	41.32	Ros	36x5	40x5†	Smi	.....	7000	158	72
Master AL	4290	Buda YTU	4½x6	32.4	L	C	Chic	PT	FS	Mas	G	Pier	B-Li	DP	Eis	.....	B-Li	A	4	Spic	Det	W	Timk	Flot	10	41.32	Ros	36x5	40x5†	Smi	.....	7200	194	72
Master E	4640	Buda YTU	4½x6	32.4	L	C	Chic	PT	FS	Mas	G	Pier	B-Li	DP	Eis	.....	B-Li	A	4	Spic	Det	R	Walk	Flot	11.5	46	Ros	36x5	40x5†	Wal	.....	7200	194	72
Master EL	4740	Buda YTU	4½x6	32.4	L	C	Chic	PT	FS	Mas	G	Pier	B-Li	D	Eis	.....	B-Li	A	4	Spic	Det	R	Walk	Flot	11.5	46	Ros	36x5	40x5†	Wal	.....	7000	158	72
Menominee G	4270	Wis VAU	4½x6	32.4	L	C	.....	Fin	FS	Strm	G	Mon	Det	DP	Eis	.....	Cott	A	4	Spic	Tut	W	Timk	.....	10.3	56.16	Ros	36x5	36x5†	Stn	Fir	.....	160	80
Nelson & LeMoon F3½	.....	Cont E4	4¼x6½	28.9	T	C	Chic	Fin	S	Strm	G	Mon	B-Li	DD	Bos	W	B-Li	U	4	Own	Tut	W	Timk	.....	8.7	42	Lav	36x5	36x5†	Pru	Gdy	6000	Op	80
Noble E70	.....	Buda YTU	4½x6	32.4	L	C	Chic	Fin	F	Strm	G	Pier	Full	DP	Eis	W	War	A	4	M-E	Tut	W	Shel	½Fl	8.7	42	Lav	36x5	36x10	Bim	Fir	6500	182	85
Northway B3	.....	Own	4 x6	25.6	H	C	GO	C	F	Strm	V	Pier	Full	DP	Wag	W	Full	U	4	Spic	Per	W	Shel	½Fl	10	49.2	Ros	36x5	40x5†	Cla	.....	7260	Op	72
*O.K. 3½ T	4250	Buda YTU	4½x6	28.9	L	C	RT	PT	FS	Zen	V	Pier	Full	DD	Eis	.....	Full	A	4	Hart	Cham	W	Wis	.....	10	.....	Ros	36x5	36x5†	Bim	.....	.....	164	.....
*Old Reliable C	4500	Wis UAU	4¼x6	28.9	...	C	Chic	PT	FS	Strm	V	Mon	Full	DD	Bos	.....	Full	A	4	Spic	Shel	W	Shel	½Fl	8.7	42.5	Ros	34x5	36x5†	StM	.....	6650	160	75
*Oneida D9	4350	Oneida	4½x5½	32.4	L	C	Own	C	...	Strm	...	Own	Own	DP	.....	.....	Own	A	4	Own	Math	W	Own	½Fl	10.33	48	.....	36x5	36x10	.....	.....	7500	170	.....
*Orleans C	4400	Hev	4½x6	32.4	L	C	Chic	PT	F	Opt	...	Dup	Det	D	Opt	Opt	Cott	...	4	Bld	.....	W	Wis	.....	10.33	.....	Ros	36x5	36x5†	.....	.....	6125	172	80
Paige 51-18	4385	Hin Ha 200	4½x5½	32.4	L	C	Own	Fin	S	Strm	G	Sim	B-Li	DD	Bos	Opt	B-Li	A	4	Spic	Per	W	Timk	Flot	10.3	50.01	Jac	36x5	36x5†	Opt	Fir	7000	160	85
*Parker J20	.....	Wis VAU	4½x6	32.4	L	C	Own	PT	F	Strm	G	Mon	B-Li	DD	Bos	W	War	A	4	Spic	Per	W	Timk	Flot	10.3	50.01	Jac	36x5	36x5†	Opt	Fir	7000	160	85
Pierce Arrow W2	4950	Own	4½x6¾	32.4	T	...	.....	.....	F	Strm	F	Own	.....	DD	Del	.....	.....	A	4	.....	.....	W	.....	.....	8.1	49	.....	36x5†	36x5†	Day	.....	8350	162	85
Powers C	.....	Hink HA	4½x5½	32.4	L	G	GO	PT	F	Zen	...	Hin	Det	D	Eis	Bj	Full	A	4	UM	Row	W	Wis	½Fl	10	.....	Ros	36x5	40x10	StM	.....	6420	167	66⅔
Republic 20	3845	Cont E4	4½x5½	32.4	L	C	Own	Fin	FS	Strm	G	Phar	Full	DD	Bos	.....	Full	U	4	Hart	.....	I	Torb	D	10.3	48	Jac	36x5	36x10	Smi	Fir	6250	165	.....
Reynolds 7A	.....	Hink HA 1600	4½x5½	32.4	H	G	Lng	Fin	F	Strm	G	Hin	Covt	DD	Bos	W	Covt	A	4	Sned	Per	W	Shel	.....	8.7	44.36	Lav	36x5	36x5†	Smi	.....	.....	176	80
Sandow M	4395	Cont E4	4½x5½	32.4	L	G	.....	Fin	FS	Strm	G	Mon	.....	DD	Bos	.....	B-Li	A	4	Spic	GC	W	Timk	.....	10	42	Ros	36x5	36x5†	Pru	.....	6500	175	70
Sanford W35	4200	Cont E4	4½x5½	32.4	L	G	MoC	Fin	F	Strm	G	Pier	B.B.	DP	Eis	.....	B-Li	A	4	Spic	Per	W	Sheb	½Fl	8.7	34.8	Ros	36x5	36x5†	Hoo	Fir	6750	174	75
*Schacht	.....	Buda XTU	4¼x6	28.9	L	G	Own	Fin	F	Sheb	G	Dup	Own	C	Bos	.....	Own	A	4	M&E	Nat	W	Own	Flot	.....	.....	Own	36x5	36x5†	StM	.....	6500	168	70
Selden 3½A	4325	Cont E7	4½x5½	32.4	L	G	Lng	Fin	FS	Strm	G	Pier	B-Li	D	Eis	.....	B-Li	A	4	Spic	Per	W	Timk	Flot	8.7	42	Gem	36x5	36x10	Stn	.....	7200	162	78
Service 71	4285	Buda HU	4¼x5½	28.9	L	C	.....	Fin	F	Strm	G	Sim	B.B.	DP	Eis	.....	.....	A	4	Spic	.....	W	Timk	.....	8.75	42.35	Ros	36x5	36x5†	.....	.....	6930	171	70
Service 76	4485	Buda YU	4½x6	32.4	L	C	.....	Fin	F	Strm	G	Sim	B.B.	DP	Eis	.....	.....	A	4	Spic	.....	W	Timk	.....	7.8	37.75	Ros	36x5	36x5†	.....	.....	7280	171	70
Signal M	4275	Cont E4	4½x5½	32.4	L	C	McC	Fin	FS	Strm	G	Pier	B-Li	DD	Eis	.....	B-Li	A	4	Spic	Det	W	Timk	Flot	12	58.08	Ros	36x5	40x10	Hay	.....	7780	168	78
*Standard 66	.....	Cont E7	4½x5½	32.4	L	C	Lng	ZZT	S	Strm	V	Mon	B-Li	DD	Eis	.....	B-Li	A	4	Spic	Per	W	Timk	Flot	10.3	50	Gem	36x5	36x5†	.....	.....	6480	160	70
Sterling 3½	.....	Ster DU	4½x6¼	32.4	L	C	Own	C	F	Rayf	V	Wau	M-E	WD	Eis	.....	Own	A	3	Spic	Math	W	Timk	Flot	8.75	39.5	Ros	36x5	40x5†	Pru	.....	8300	162	92
*Stewart 10	4100	Cont E7	4½x5½	32.4	L	...	Bus	PT	FS	Zen	G	Pier	Full	DP	Eis	.....	Full	U	4	Hart	Det	I	Cl	D	10	48	Ros	36x5	40x5†	Cla	Fir	6080	165	80
*Stewart 10X	4100	Buda YTU	4½x6	32	...	...	Bus	T	FF	Zen	G	Pier	Full	DP	Eis	.....	Full	U	4	Hart	Det	I	Cl	D	10	48.01	Ross	36x5	36x5	Cla	Fir	.....	165	80
*Tiffin PW	4760	Cont E4	4½x5½	32.4	L	C	.....	Fin	S	Sheb	G	Pier	B.B.	.....	Bos	.....	Full	A	4	Acm	Kal	W	Shel	.....	8.7	41.7	Ros	36x5	36x5†	Smi	Gdy	6850	160	80
*Titan 3½	4550	Buda YTU	4½x6	32.4	L	G	B&W	ZZT	F	Strm	G	Sim	B.B.	DP	Eis	.....	Cott	A	4	UP	Math	I	Cl	D	9	48	Lav	36x5	40x5†	Day	.....	7300	156	70
*Tower G3½	4400	Cont E4	4½x5½	32.4	L	C	Own	PT	S	Zen	G	Pier	Full	DP	Eis	.....	Full	U	4	Spic	Det	W	Timk	Flot	10.33	50	Ros	36x5	36x5†	Pru	Gdy	7010	165	70
Transport 70	4195	Buda	4½x6	32.5	L	G	Spi	C	F	Strm	G	Dup	B.B.	D	Eis	.....	Cott	U	4	Hart	Det	I	Cl	D	10.1	.....	Jac	36x5	36x10	.....	Fir	7150	170	80
Twin City 3½	.....	Own	4¼x6	28.9	H	C	Spi	H	F	Sheb	V	Own	B.B.	D	Bos	.....	Full	A	4	Spic	Math	W	Timk	.....	10.33	49.58	Ros	36x5	40x5†	Smi	.....	6800	168	80
Twin City 4 Wheel D. B	4750	Wis JA	5⅛x6	42	T	...	.....	C	FS	Strm	G	Pier	M-E	WD	KW	.....	Cott	A	3	.....	.....	I	.....	½Fl	.....	.....	Ros	36x5	36x6	Arc	.....	7200	146	60
*United C 3½	3975	Buda HTU	4¼x5½	28.9	L	C	Spi	.....	F	Strm	G	Sim	Full	DD	Eis	Opt	Full	A	4	Bld	.....	I	Cl	D	10	48.1	Ros	36x5	36x5†	Cla	.....	.....	157	70
*Ward LaFrance 4A	4690	Own	4½x6¼	32.4	L	...	.....	.....	...	Zen	G	.....	B-Li	DP	Bos	.....	B-Li	A	4	M&E	Mer	W	Timk	.....	7.8	37.75	Ros	36x5	36x5†	Smi	.....	7750	162	85
*Watson N	.....	Cont E4	4½x5½	32.4	L	C	R-T	PT	FS	Strm	G	Pier	B-Li	D	Sim	.....	B-Li	A	4	Spic	Shel	W	Wis	.....	9	.....	Gem	36x5	36x10	.....	.....	6600	168	75
*Wichita O	4000	Beav JB	4¼x6	28.9	H	G	EM	C	F	Strm	G	Dup	.....	C	Ber	.....	.....	A	4	Own	Det	W	Shel	½Fl	11.75	61.10	Ros	36x5	36x5†	Smi	.....	6500	165	80
*Wilcox E	.....	Buda	4½x6	32.4	L	C	.....	PT	S	Strm	G	Dup	Own	C	Bos	.....	Own	A	4	Own	Shel	W	Wis	½Fl	10	45.1	Own	36x5	36x5†	.....	.....	6600	147	75
Wilson G	4300	Own	4¼x5½	28.9	L	C	.....	Fin	FS	Mar	V	Pier	B.B.	DP	Eis	.....	Own	A	4	K-B	Per	W	Timk	.....	8.7	42.3	Ros	36x5	36x5†	Smi	.....	6800	160	80
Winther 70	4200	Wis TAU	4 x6	25.6	L	G	Brm	Fin	F	Mas	V	.....	B.B.	DP	Eis	W	B-Li	A	4	Bld	Math	I	Cl	D	9	36	Ros	36x5.	36x5†	Cla	Fir	6400	150	85
4 Ton																																			
American	4575	Wis	4½x6	32.4	L	G	GO	Fin	F	Strm	G	Pier	Det	DP	Eis	.....	Covt	A	4	Acm	SP	W	Wis	½Fl	10	.....	Lav	36x5	36x5†	Smi	.....	6475	158	.....
Bessemer K2	.....	Cont E7	4½x5½	32.4	L	C	.....	C	FS	Strm	G	Pier	B.B.	DP	Bos	.....	B-Li	A	4	Spic	Per	I	Torb	D	10	49.5	Ros	36x5	36x10†	Sch	Fir	6740	175	75
Bethehem J	3995	Own J	4½x5½	32.6	L	C	Liv	C	F	Zen	G	Pier	Full	DD	Bos	GD	Full	U	4	UP	Math	I	Torb	Flot	10.2	49	Lav	36x5	36x5†	Smi	.....	6100	162	.....
*Bridgeport 4C	3850	Buda YTU	4½x6	32.4	L	G	Own	.....	FS	Strm	...	Pier	B.B.	.....	Eis	.....	.....	A	4	Hart	.....	W	Wis	.....	10	.....	Ros	36x6	36x10	Arc	.....	9000	170	70
Denby 27	4600	Cont E7	4½x5½	32.4	L	G	Lng	PT	FS	Strm	G	Sim	Own	DD	Eis	.....	War	A	4	Pet	Det	I	Cl	D	10	49.9	Ros	36x5	36x5†	Smi	.....	7020	170	78
Double-Drive B	4000	Buda HTU	4¼x5½	28.9	L	G	.....	PT	F	Zen	V	Pier	B.B.	DD	Lor	Opt	Own	A	4	Own	Own	W	Own	½Fl	9.75	48.75	Lav	36x6	36x6	Stn	.....	.....	130	55
Highway-Knight A	.....	R & V-W	4 x6	25.6	S	G	Own	PT	F	Zen	V	Mon	Own	DP	Eis	Wg	Own	A	4	Ther	.....	W	Shel	.....	8.7	42.3	Ros	36x5	36x6†	Sch	.....	7400	159	90
*Jumbo 40	5200	Buda YU	4½x6	32.4	L	G	Own	PT	F	Zen	G	Sim	B-Li	D	Eis	.....	B-Li	U	4	Spic	Per	I	Cl	D	10	53.5	Jac	38x7*	44x10	Cla	.....	7800	165	75
Kelly-Springfield K45	4550	Own	4½x6½	32.4	T	C	Lng	Fin	F	Zen	G	Pier	Own	C	Eis	W	Covt	A	3	Own	Per	C	Own	D	10.7	32.3	Gem	36x5	40x6†	StM	.....	8125	150	93
Kimball E	5000	Wis RAU	4¾x6	36.1	L	G	Flex	PT	F	Zen	V	Dup	B-Li	DP	Ber	W	B-Li	A	4	Spic	US	W	Shel	½Fl	8.7	42.3	Ros	36x5	40x10	Smi	Fir	8100	Op	66
King Zeitler	5000	Cont E4	4½x5½	32.4	L	G	.....	PT	FS	Strm	G	Pier	B-Li	DD	Bos	.....	B-Li	A	4	Ther	Mer	W	Timk	Flot	10	49	Lav	36x5	40x5†	StM	.....	6500	172	80
Kissel Heavy Duty	4475	Own 14000	4¼x5½	28.9	L	G	MoC	.....	S	Strm	V	Pier	.....	.....	Eis	.....	War	A	4	Spic	Shel	W	Shel	.....	11.7	58.6	Ros	36x5	36x5†	Smi	.....	6840	168	74

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Trade Name and Model	Chassis Price	ENGINE DETAILS: Make and Model Number 4 Cylinder unless otherwise noted	Bore and Stroke	N. A. C. C. Horsepower	Valve Arrange't	How Cooled	Radiator (Make)	Radiator (Type)	Lubrication	Carburetor	Fuel Feed	Governor (Make)	Clutch (Make)	Clutch (Type)	Ignition System	Engine Starter	GEARSET: Make	Location	Speeds	Universal (Make)	Springs (Make)	REAR AXLE: Final Drive	Make	Type	Total Gear Reduction in High	Total Gear Reduction in Low	Steering Gear (Make)	TIRES, WHEELS, RIMS: *Pneumatic †Dual Front	Rear	Wheels (Make)	Rim Equipment	Chassis Weight	Wheelbase	Pr. Cent of Weight on Rear Wheels
5½, 6, 7 Ton Con'd		1			2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	19	20			21			22	23			
Hall	5100	Cont E4	4¼x5½	28.9	L	G	Own	Fin	FS	Zen	G	Dup	B-Li	DP	Bos	.....	B-Li	U	..	Opt	Det	C	Timk	D	12	.....	Gem	36x5	40x6†	Smi	.....	7530	Op	....
Kelley-Springfield K60	5500	Own	4½x6½	32.4	T	C	Lng	Fin	F	Zen	G	Pier	Own	C	Eis	W	Covt	A	3	Own	Per	C	Own	D	12.39	45.2	Gem	36x6	40x7†	StM	.....	8900	150	93
*Maccar G1	5500	Cont B2	4¾x6	36	L	C	Own	Fin	FS	Zen	G	Pier	B-Li	DD	Eis	.....	B-Li	A	4	Spic	Mer	W	Timk	Flot	10.2	49.6	Ros	36x5	40x6†	Day	Fir	8750	186	70
MacDonald A	5750	Buda YTU	4½x6	32.4	L	C	Own	PT	F	Strm	G	Dup	B-Li	DD	Spl	.....	B-Li	U	4	Own	Own	....	Own	D	17.5	77	Own	40x7	Opt	Opt	.....	6000	...	66
Mack AC	5750	Own	5 x6	40	L	C	Own	Fin	S	Zen	G	Own	Own	DP	Aer	.....	Own	UJ	3	Spic	Mer	C	Own	D	10.50	33.7	Own	36x6	40x12	Sch	.....	8672	Op	73
Mack AC	6000	Own AC	5 x6	40	L	C	Own	Fin	S	Zen	G	Own	Own	DP	Aer	.....	Own	UJ	3	Spic	Mer	C	Own	D	11.58	37.1	Own	36x7	40x7†	Sch	.....	9050	Op	73
*Old Reliable K, L, M	6250	Wau PU7	4¾x6¼	36.1	...	C	Chic	PT	FS	Strm	G	Wau	War	WD	Bos	.....	D-Se	A	4	Spic	Shel	C	Shel	D	10.86	54.9	Ros	36x6	40x7†	Smi	.....	10240	136	78
Royal 6	.....	Wis RBU	4¾x6	36.1	...	C	.....	H	...	Strm	...	Mon	.....	WD	Bos	Op	Own	...	..	Own	Mer	W	Timk	.....	.....	.....	Ros	36x6	40x6†	.....	.....	.....	168	....
Royal 7	.....	Wis RBU	5¼x7	44.1	...	C	.....	H	...	Strm	...	Mon	.....	WD	Bos	Op	Own	A	...	.....	Mer	W	Timk	.....	.....	.....	Ros	36x7	40x7†	.....	.....	.....	168	....
Sterling 7½-Chain	.....	Ster EU	5 x6¼	40	L	C	Own	C	...	Rayf	V	Wau	M-E	WD	Eis	.....	Own	A	6	UM	Mat	C	Own	D	7.26	43.6	Ros	36x6	40x7†	Pru	.....	11000	174	91
*Tiffin 6	6050	Cont B2	4¾x6	36.1	L	C	.....	Fin	FS	Sheb	G	....	B.B.	D	Bos	W	Covt	A	3	Acm	Kal	W	Shel	.....	10	60.7	Ros	36x6	40x12	Smi	Gdy	9000	168	80
*Wichita S	5000	Beav JB	4½x6	32.4	H	G	EM	C	F	Strm	G	Dup	.....	C	Ber	.....	.....	A	4	Own	Det	R	Own	½Fl	14	66.3	Ros	36x6	40x6†	Smi	.....	9000	165	80
Winther 140	5900	Wis-RBU	5 x6	40	L	G	Brm	Fin	F	Mas	V	Dup	B.B.	DP	Eis	W	B-Li	A	4	Bld	Math	I	Cl	D	12	60.5	Ros	36x6	40x7	Cla	.....	9600	162	80
Gasoline Tractor-Trucks																																		
Columbia GT	2850	Hink HAA	4 x5¼	25.6	L	C	Lng	Fin	FS	Strm	...	Hink	Det	DP	Dix	U	Cott	A	4	Spic	Per	I	Rus	D	9.5	40.7	Own	36x4	36x7	Det	Fir	4200	112	80
Federal Light Duty	3325	Cont C4	4½x5½	27.2	L	C	Own	Fin	FS	Zen	G	Phar	B.B.	DP	Eis	.....	Own	A	4	Spic	Math	W	Timk	.....	9.2	59.8	Gem	36x4	36x7	.....	Fir	4700	110	....
Federal Heavy Duty	4300	Cont E4	4½x5½	32.4	L	C	Own	Fin	FS	Zen	G	Phar	B.B.	DP	Eis	.....	Own	A	4	Spic	Math	W	Timk	.....	12	48.8	Gem	36x5	36x5†	.....	Fir	6800	114	....
Garford 70H	.....	Buda HTU	4¼x5½	28.9	L	C	Own	Fin	F	Strm	G	Sim	B-Li	DD	Spl	A	.....	...	4	Spic	Per	W	Timk	.....	.....	.....	Ros	36x4	36x7	.....	.....	4750	119	....
Garford 77C	.....	Wis AU	4¾x5½	36.1	T	C	Own	Fin	F	Rayf	G	Sim	B-Li	DD	Eis	A	.....	...	4	Spic	Per	W	Timk	.....	.....	.....	Ros	36x5	40x5†	Smi	.....	7200	105	....
Garford 68	.....	Wis AU	4¾x5½	36.1	T	C	Own	.....	F	Rayf	G	Sim	B-Li	.....	Eis	A	.....	...	4	Spic	Per	C	Own	D	.....	.....	Ros	36x6	40x6	Smi	.....	8450	102	....
Hewitt-Ludlow 6-Ton	.....	Buda HTU	4¼x5½	28.9	...	C	.....	.....	F	Strm	...	.....	B.B.	...	Bos	.....	.....	...	4	.....	...	C	.....	D	.....	.....	Lav	36x5	36x4†	.....	.....	4000	...	....
Hood	1350	Own	3¾x3¾	22.5	T	C	Idl	.....	S	Holl	G	.....	.....	D	...	U	.....	U	2	Own	Lah	C	Own	....	8	24	Own	20x3½	20x5	Own	.....	2900	60	65
Jumbo C	3450	Buda HTU	4¼x5½	28.9	L	C	Own	PT	F	Zen	V	Dup	Full	D	NE	Op	Full	U	4	Arv	Det	I	Cl	D	9	43.2	Jac	36x4	36x7	Day	.....	4450	152	60
Knox 35	6000	Own 35	5 x5½	40	H	C	Fed	H	F	Zen	V	.....	.....	DP	...	GD	.....	A	3	.....	.....	W	Timk	.....	1	.....	Ros	36x4	38x6†	Wau	.....	8500	108	60
Knox 36—3- Ton	6500	Own 35	5 x5½	40	H	C	Fed	H	F	Zen	V	.....	.....	DP	...	GD	.....	A	3	.....	.....	W	Timk	.....	1	.....	Ros	36x4	38x6†	Wau	.....	10000	108	....
*Koehler MT	3450	Her CU3	4 x5⅛	25.6	L	C	Own	.....	F	Zen	G	Sim	B-Li	D	Eis	.....	B-Li	A	4	Spic	Math	W	Timk	.....	9.25	37	Lav	36x4	36x7†	Wau	.....	4750	142	....
Kuhn	.....	Wis	4¼x5½	28.9	T	C	.....	H	S	Rayf	...	.....	.....	C	Bos	.....	.....	...	4	.....	.....	B	Own	.....	.....	.....	.....	36x7	36x7†	.....	.....	9000	138	....
Lombard	.....	Spec 6	5½x6¾	72.7	...	C	Spec	H	F	Strm	P	.....	.....	D	...	.....	Spec	A	...	.....	.....	W	.....	.....	.....	.....	Spe	.....	.....	.....	.....	8000	...	90
Mack AB 5-Ton	3400	Own AB	4 x5	25.6	L	C	Own	C	S	Zen	G	Own	B-Li	DD	Aer	.....	B-Li	U	4	Bld	Mer	C	Own	D	10.5	42.2	Own	36x4	36x4†	Sch	.....	4940	120	....
Mack AC 7-Ton	4950	Own AC	5 x6	40	L	C	Own	PT	S	Zen	G	Own	Own	DP	Aer	.....	Own	UJ	3	Spic	Mer	C	Own	D	10.7	34.6	Own	36x5	40x5†	Sch	.....	7670	119	....
Mack AC 10-Ton	5500	Own AC	5 x6	40	L	C	Own	PT	S	Zen	G	Own	Own	DP	Aer	.....	Own	UJ	3	Spic	Mer	C	Own	D	11.5	37.1	Own	36x6	40x6†	Sch	.....	8250	119	....
Mack AC 13-Ton	5750	Own AC	5 x6	40	L	C	Own	PT	S	Zen	G	Own	Own	DP	Aer	.....	Own	UJ	3	Spic	Mer	C	Own	D	12.9	41.5	Own	36x6	40x12	Sch	.....	8272	119	....
Mack AC 15-Ton	6000	Own AC	5 x6	40	L	C	Own	PT	S	Zen	G	Own	Own	DP	Aer	.....	Own	UJ	3	Spic	Mer	C	Own	D	14.1	45.2	Own	36x7	40x7†	Sch	.....	8650	119	....
Master T	3740	Buda HU	4¼x5½	28.9	L	C	Chic	PT	FS	Mas	G	McC	B-Li	DP	Eis	.....	B-Li	U	4	Spic	Det	R	Walk	Flot	8	32	Ros	34x4	36x4†	Wal	.....	4500	110	76
Rennoc 8-Ton	.....	Buda	4½x5½	27.2	L	C	.....	.....	F	Strm	...	Pier	.....	D	Spl	.....	War	...	4	Hart	Row	W	Wis	.....	.....	.....	Lav	35x5	36x7	.....	.....	5050	116	60
Watson	.....	Cont E4	4½x5½	32.4	L	G	Jam	C	FS	Strm	G	Pier	B-Li	DP	Sim	.....	B-Li	U	4	Spic	Shel	W	Timk	Flot	8.75	.....	Gem	34x4	36x10	.....	.....	6500	80	37

Electric Commercial Cars

Electric Commercial Cars

E. C. M. Name and Model Number	Carrying Capacity	Chassis Weight	Chassis Price	Maximum Speed	Battery	Mileage Per Charge	Motor	Controller	Speeds Forward	Drive	Rear Axle	Springs	Front Tires	Rear Tires	Steering Gear	Wheelbase	Pr. Cent of Weight on Rear Wheels
Ward WS	750	1400	.....	12	Opt	45	G-E	Own	4	W	Shel	Shel	32x2½	32x3	Own	88	60
C-T ½	1000	1800	2200	14	Opt	60	G-E	Own	4	C-T	Flot	Shel	36x3	36x3	W	89¼	60
Walker M	1000	2300	.....	15	Opt	60	West	West	5	O	Own	Math	34x3	36x3½	Ross	93	66
Atlantic 1C	2000	2770	.....	12	Opt	.....	G-E	G-E	4	C	Timk	S-El	34x4	36x4	Ross	103	65
Ward WA	1250	2730	.....	12	Opt	47	G-E	G-E	4	W	Shel	Shel	32x3	34x3½	Own	90	60
C-T 1	2000	2500	2675	14	Opt	60	G-E	Own	4	C-T	Flot	Shel	36x3½	36x4	W	101	60
Steinmetz	.....	.....	.....	16	Exide	.....	Own	.....	4	B	.....	.....	32x4*	32x4*	.....	Opt	....
Walker K	2000	2700	.....	14	Opt	60	West	West	5	O	Own	Math	34x3½	36x4	Ross	96	66
Ward WB	2000	3430	.....	10	Opt	43	G-E	G-E	4	W	Shel	Shel	34x3½	36x4	Own	102	60
Atlantic 2C	4000	3590	.....	11	Opt	.....	G-E	G-E	4	C	Timk	S-El	34x4	36x3†	Ross	115	65
C-T 2	4000	3500	3100	12	Opt	60	G-E	Own	4	C-T	Flot	Shel	36x4	36x4†	W	116	60
Walker L	4000	3800	.....	13	Opt	60	West	West	5	O	Own	Math	38x4	38x6	Ross	112	66
Ward WD	4000	4500	.....	8.5	Opt	35	G-E	G-E	4	W	Shel	Shel	36x4	36x7	Own	114	60
Atlantic 3C	7000	5220	.....	10	Opt	.....	G-E	G-E	5	C	Timk	.....	36x5	40x5†	Ross	135	65
C-T 3½	7000	5000	4500	11	Opt	50	G-E	Own	4	I	Dead	Shel	36x6†	36x4†	W	122	55
Ward WF	7000	6600	.....	7	Opt	30	G-E	G-E	4	W	Shel	Shel	36x5	36x8	Own	132	60
Atlantic 5C	10000	6230	.....	9	Opt	.....	G-E	G-E	5	C	Timk	S-El	36x6	40x5†	Ross	144	65
Couple Gear H	7000	9000	.....	10	Phil	30	Own	Own	5	B	Own	Tut	36x5†	36x5†	Own	96	55
*Couple Gear A	10000	10000	.....	7	Phil	30	Own	Own	5	B	Own	Tut	36x5†	36x5†	Own	96	75
C-T 5	10000	6000	5000	10	Opt	50	G-E	Own	4	I	Dead	Shel	36x7	36x5†	W	132	55
Walker P	7000	5600	.....	11	Opt	50	West	West	5	O	Own	Math	36x5	38x5†	Ross	131	66
Walker N	10000	6400	.....	10	Opt	50	West	West	5	O	Own	Math	36x6	38x6†	Ross	141	66
Ward WH	10000	8375	.....	6	Opt	26	G-E	G-E	4	W	Shel	Shel	36x7	40x10	Own	144	60
Atlantic 6C	13000	6940	.....	8	Opt	.....	G-E	G-E	5	C	Timk	S-El	36x6	40x6	Ross	156	65
*Couple Gear LH	14000	11000	.....	10	Phil	30	Own	Own	5	B	Own	Tut	36x5†	36x5	Own	96	55

Manufacturers Whose Models Are Included in Specifications on Preceding Pages

Acason—Acason Motor Truck Co., Detroit, Mich.
Ace—American Motor Truck Co., Newark, Ohio.
Acme—Acme Motor Truck Co., Cadillac, Mich.
Aetna—Aetna Motors Corp. of N. Y., New York, N. Y.
All-American—All-American Truck Co., Chicago, Ill.
All-Power—All-Power Truck Co., Detroit, Mich.
American—American Motor Truck & Tractor Co., New York, N. Y.
Apex—Hamilton Motor Co., Grand Haven, Mich.
Armleder—O. Armleder Co., Cincinnati, Ohio.
Atco—American Truck & Trailer Corp., Kankakee, Ill.
Atlantic—Atlantic Electric Vehicle Co., Newark, N. J.
Atlas—Atlas Truck Corp., York, Pa.
Atterbury—Atterbury Motor Car Co., Buffalo, N. Y.
Autocar—Autocar Co., Ardmore, Pa.
Available—Available Truck Co., Chicago, Ill.

Beck-Hawkeye—Beck-Hawkeye Motor Truck Works, Cedar Rapids, Iowa.
Bell—Iowa Motor Truck Co., Ottumwa, Ia.
Belmont—Belmont Motors Corp., Lewistown, Pa.
Bessemer—Bessemer Motor Truck Co., Grove City, Pa.
Bethlehem—Bethlehem Motor Truck Corp., Allentown, Pa.
Betz—Betz Motor Truck Co., Hammond, Ind.
Birch—Birch Motor Cars, Chicago, Ill.
Bridgeport—Bridgeport Motor Truck Co., Bridgeport, Conn.
Brinton—Brinton Motor Truck Co., Philadelphia, Pa.
Brockway—Brockway Motor Truck Co., Cortland, N. Y.

C. T.—Commercial Truck Co., Philadelphia, Pa.
Capitol—Capitol Motors Corp., Fall River, Mass.
Chevrolet—Chevrolet Motor Co. of Mich., Flint, Mich.
Chicago—Chicago Motor Truck, Inc., Chicago, Ill.
Climber—Climber Motor Corp., Little Rock, Ark.
Clydesdale—Clydesdale Motor Truck Co., Clyde, Ohio.
Collier—Collier Motor Truck Co., Bellevue, Ohio.
Columbia—Columbia Motor Truck & Trailer Co., Pontiac, Mich.
Comet—Comet Automobile Co., 156 S. Water St., Decatur, Ill.
Commerce—Commerce Motor Car Co., Detroit, Mich.
Concord—Abbot-Downing Truck & Body Co., Concord, N. H.
Conestoga—Conestoga Motor Truck Co., Lancaster, Pa.
Cook—Cook Motors Corp., Kankakee, Ill.
Corbitt—Corbitt Motor Truck Co., Henderson, N. C.
Couple Gear—Couple Gear Freight Wheel Co., Grand Rapids, Mich.

Dart—Dart Truck & Tractor Corp., Waterloo, Ia.
Day-Elder—Day-Elder Motors Corp., Newark, N. J.
Dearborn—Dearborn Truck Co., Chicago, Ill.
Defiance—Defiance Motor Truck Co., Defiance, Ohio.
DeKalb—DeKalb Wagon Co., DeKalb, Ill.
Denby—Denby Motor Truck Co., Detroit, Mich.
Dependable—Dependable Truck & Tractor Co., Galesburg, Ill.
Diamond T—Diamond T Motor Car Co., Chicago, Ill.
Diehl—Diehl Motor Truck Works, Philadelphia, Pa.
Doane—Doane Motor Truck Co., San Francisco, Cal.
Dodge—Dodge Bros., Detroit, Mich.
Dorris—Dorris Motor Car Co., St. Louis, Mo.
Double Drive—Double Drive Truck Co., Chicago, Ill.
Douglas—Douglas Motors Corp., Omaha, Nebr.
Duplex—Duplex Truck Co., Lansing, Mich.
Duryea—Duryea Motors, Inc., Philadelphia, Pa.
Duty—Duty Motor Co., Greenville, Ill.

Eagle—Eagle Motor Truck Corp., St. Louis, Mo.
Ellsworth—Mills-Ellsworth Co., Keokuk, Ia.
Elmira—Elmira Commercial Motor Car Co., Inc., Owego, N. Y.
Erie—Erie Motor Truck Mfg. Co., Erie, Pa.

F. W. D.—Four Wheel Drive Auto Co., Clintonville, Wis.
Fageol—Fageol Motors Co., Oakland, Cal.
Famous—Famous Trucks, Inc., St. Joseph, Mich.
Fargo—Fargo Motor Truck Co., Chicago, Ill.
Federal—Federal Motor Truck Co., Detroit, Mich.
Ford—Ford Motor Co., Highland Park, Mich.
Forschler—Forschler Motor Truck Mfg. Co., New Orleans, La.
Front Drive—Double Drive Truck Co., Chicago, Ill.
Fulton—Fulton Motors Corp., New York, N. Y.

G. M. C.—General Motors Truck Co., Pontiac, Mich.
G. W. W.—Wilson Truck Mfg. Co., Henderson, Ia.
Garford—Garford Motor Truck Co., Lima, Ohio.
Gary—Gary Motor Truck Co., Gary, Ind.
Gersix—Gersix Mfg. Co., Seattle, Wash.
Giant—Giant Truck Corp., Chicago Heights, Ill.
Graham—Graham Brothers, Evansville, Ind.
Gramm-Bernstein—Gramm-Bernstein Motor Truck Co., Lima, Ohio.
Grant—Grant Motor Car Corp., Truck Division, Cleveland, Ohio.

Hahn—Hahn Motor Truck & Wagon Co., Hamburg, Pa.
Hal-Fur—Hal-Fur Motor Truck Co., Cleveland, Ohio.
Hall—Lewis-Hall Motors Corp., Detroit, Mich.
Harvey—Harvey Motor Truck Co., Harvey, Ill.
Hawkeye—Hawkeye Truck Co., Sioux City, Ia.
Hendrickson—Hendrickson Motor Truck Co., Chicago, Ill.
Hewitt-Ludlow—Ralston Iron Works, San Francisco, Cal.
Highway-Knight—Highway Motors Co., Chicago, Ill.
Higrade—Higrade Motors Co., Harbor Springs, Mich.
H & M—H & M Motor Truck Co., Inc., Baltimore, Md.
Hood—Hood Mfg. Co., Seattle, Wash.
Hoover—Hoover Wagon Co., York, Pa.
H. R. L.—H. R. L. Motor Co., Seattle, Wash.
Huffman—Huffman Bros. Co., Elkhart, Ind.
Hurlburt—Harrisburg Mfg. & Boiler Co., Harrisburg, Pa.

Independent—Independent Motor Co., Youngstown, O.
Independent—Independent Motor Truck Co., Inc., Davenport, Ia.
Indiana—Indiana Truck Corp., Marion, Ind.
International—International Harvester Co., Chicago, Ill.

Jackson—Jackson Motors Corp., Jackson, Mich.
Jumbo—Nelson Motor Truck Co., Saginaw, Mich.

Kalamazoo—Kalamazoo Motor Corp., Kalamazoo, Mich.
Kankakee—Kankakee Automobile Co., Kankakee, Ill.
Karavan—Caravan Motors Co., Portland, Ore.
Kearns—Kearns-Dughie Motors Co., Danville, Pa.
Keldon—House Cold Tire Setter Co., St. Louis, Mo.
Kelly-Springfield—Kelly-Springfield Motor Truck Co., Springfield, Ohio.
Keystone—Keystone Motor Truck Corp., Philadelphia, Pa.
Kimball—Kimball Motor Truck Co., Los Angeles, Cal.
King Zeitler—King Zeitler Co., Chicago, Ill.
Kissel—Kissel Motor Car Co., Hartford, Wis.
Kleiber—Kleiber & Co., Inc., San Francisco, Cal.
Knox—Knox Motors Co., Springfield, Mass.
Koehler—H. J. Koehler Motors Corp., Bloomfield, N. J.
Kuhn—Kuhn Tractor Truck Co., Seattle, Wash.

Lange—Lange Motor Truck Co., Pittsburgh, Pa.
Larrabee-Deyo—Larrabee-Deyo Motor Truck Co., Inc., Binghamton, N. Y.
L. M. C.—Louisiana Motor Car Co., Shreveport, La.
Lombard—Lombard Auto Tractor Truck Corp., New York, N. Y.
Lone Star—Lone Star Truck & Tractor Assn., San Antonio, Texas.
Luedinghaus—Luedinghaus-Espenschied Wagon Co., St. Louis, Mo.
Luverne—Luverne Automobile Co., Luverne, Minn.

Maccar—Maccar Truck Co., Scranton, Pa.
MacDonald—MacDonald Truck & Tractor Co., San Francisco, Cal.
Mack—International Motor Co., New York, N. Y.
Marshall—Marshall Mfg. Co., Chicago, Ill.
Master—Master Trucks, Inc., Chicago, Ill.
Maxwell—Maxwell Motor Co., Inc., Detroit, Mich.
Menominee—Menominee Motor Truck Co., Menominee, Mich.
Moreland—Moreland Motor Truck Co., Los Angeles, Cal.
Mutual—Mutual Truck Co., Sullivan, Ind.

Napoleon—Napoleon Motors Co., Traverse City, Mich.
Nash—Nash Motors Co., Kenosha, Wis.
Nelson-LeMoon—Nelson & LeMoon, Chicago, Ill.
Netco—New England Truck Co., Fitchburg, Mass.
Niles—Niles Motor Truck Co., Pittsburgh, Pa.
Noble—Noble Motor Truck Co., Kendallville, Ind.
Northway—Northway Motors Co., Natick, Mass.
Northwestern—Starr Carriage Co., Seattle, Wash.
Norwalk—Norwalk Motor Car Co., Martinsburg, W. Va.

O. K.—Oklahoma Auto Mfg. Co., North Muskogee, Okla.
Ogden—Ogden Motor & Supply Co., Chicago, Ill.
Old Hickory—Kentucky Wagon Mfg. Co., Louisville, Ky.
Old Reliable—Old Reliable Motor Truck Co., Chicago, Ill.
Oldsmobile—Olds Motor Works, Lansing, Mich.
Oneida—Oneida Motor Truck Co., Green Bay, Wis.
Orleans—New Orleans Motor Truck Mfg. Co., New Orleans, La.
Oshkosh—Oshkosh Motor Truck Mfg. Co., Oshkosh, Wis.

Packard—Packard Motor Car Co., Detroit, Mich.
Paige—Paige-Detroit Motor Car Co., Detroit,, Mich.
Parker—Parker Motor Truck Co., Milwaukee, Wis.
Patriot—Patriot Motors Co., Lincoln, Neb.
Pierce-Arrow—Pierce-Arrow Motor Car Co., Buffalo, N. Y..
Pioneer—Pioneer Truck Co., Chicago, Ill.
Pittsburgher—Pittsburgh Truck Mfg. Co., Pittsburgh, Pa.
Power—Power Truck & Tractor Co., Detroit, Mich.

Rainier—Rainier Motor Corp., Flushing, L. I., N. Y.
Reliance—Reliance Motor Truck Co., Appleton, Wis.
Rennoc—Rennoc-Leslie Motor Co., Philadelphia, Pa.
Reo—Reo Motor Car Co., Lansing, Mich.
Republic—Republic Motor Truck Co., Inc., Alma, Mich.
Reynolds—Reynolds Motor Truck Co., Mt. Clemens, Mich.
Riker—Locomobile Co. of America, Bridgeport, Conn.
Rowe—Rowe Motor Mfg. Co., Lancaster, Pa.
Royal—Royal Motor Truck of N. Y., New York, N. Y.

Sandow—Sandow Motor Truck Co., Chicago, Ill.
Sanford—Sanford Motor Truck Co., Syracuse, N. Y.
Schacht—G. A. Schacht Motor Truck Co., Cincinnati, O.
Schwartz—Schwartz Motor Truck Co., Reading, Pa.
Selden—Selden Truck Corp., Rochester, N. Y.
Seneca—Seneca Motor Car Co., Fostoria, O.
Service—Service Motor Truck Co., Wabash, Ind.
Shaw—Walden W. Shaw Livery Co., Chicago, Ill.
Signal—Signal Motor Truck Co., Detroit, Mich.
Southern—Southern Truck & Car Corp., Greenboro, N. C.
Standard—Standard Motor Truck Co., Detroit, Mich.
Steinmetz—Steinmetz Electric Motor Car Corp., Baltimore, Md.
Sterling—Sterling Motor Truck Co., Milwaukee, Wis.
Stewart—Stewart Motor Corp., Buffalo, N. Y.
Stoughton—Stoughton Wagon Co., Stoughton, Wis.
Success—Webberville Truck Co., Webberville, Mich.
Sullivan—Sullivan Motor Truck Co., Rochester, N. Y.
Superior—Superior Motor Truck Co., Atlanta, Ga.

Texan—Texas Motor Car Asso., Fort Worth, Texas.
Tiffin—Tiffin Wagon Co., Tiffin, Ohio.
Titan—Titan Truck Co., Milwaukee, Wis.
Tower—Tower Motor Truck Co., Greenville, Mich.
Traffic—Traffic Motor Truck Corp., St. Louis, Mo.
Transport—Transport Truck Co., Mt. Pleasant, Mich. .
Traylor—Traylor Eng. & Mfg. Co., Cornwells, Pa.
Triangle—Triangle Motor Truck Co., St. Johns, Mich.
Triumph—Triumph Truck & Tractor Co., Kansas City, Mo.
Twin City F. W. D.—Twin City Four Wheel Drive Co., Inc., St. Paul, Minn.
Twin City—Minneapolis Steel & Mach. Co., Minneapolis, Minn.

Ultimate—Vreeland Motor Co., Inc., Newark, N. J.
Union—Union Motor Truck Co., Bay City, Mich.
United—United Motors Co., Grand Rapids, Mich.
U. S.—United States Motor Truck Co., Cincinnati, Ohio.

Velie—Velie Motors Corp., Moline, Ill.
Vim—Vim Motor Truck Co., Philadelphia, Pa.

Walker—Walker Vehicle Co., Chicago, Ill.
Walker-Johnson—Walker-Johnson Truck Co., Woburn, Mass.
Walter—Walter Motor Truck Co., New York, N. Y.
Ward—Ward Motor Vehicle Co., Mt. Vernon, N. Y.
Ward La France—Ward La France Truck Co., Inc., Elmira, N Y.
Watson—Watson Wagon Co., Canastota, N. Y. .
Wells—Evans Truck & Axle Co., Auburn, Ind.
White—White Co., Cleveland, Ohio.
White Hickory—White Hickory Motor Corp., Atlanta, Ga.
Wichita—Wichita Falls Motor Co., Wichita Falls, Tex.
Wilcox—H. E. Wilcox Motor Co., Minneapolis, Minn.
Wilson—J. C. Wilson Co., Detroit, Mich.
Winther—Winther Motor Truck Co., Kenosha, Wis.
Witt-Will—Witt-Will Co., Inc., Washington, D. C.
Wolverine—American Commercial Car Co., Detroit, Mich.

Price List of Truck Pneumatic Tire Casings, With Capacities and Inflation Pressures of Larger Sizes

	30 3½	32 4	34 4	32 4½	34 4½	33 5	35 5	36 x 6 Price	36 x 6 Carrying Capacity	36 x 6 Inflation Pressure	38 x 7 Price	38 x 7 Carrying Capacity	38 x 7 Inflation Pressure	40 x 8 Price	40 x 8 Carrying Capacity	40 x 8 Inflation Pressure	42 x 9 Price	42 x 9 Carrying Capacity	42 x 9 Inflation Pressure	44 x 10 Price	44 x 10 Carrying Capacity	44 x 10 Inflation Pressure
Ajax Rubber Co., Inc., New York, N. Y.																						
Ajax Cord, non-skid	.....	.....	.....	.....	.....	.....	.....	119.35	2200	90	168.80	3000	100	217.45	4000	100	.....	....	...	.....	....	...
American Rubber & Tire Co., Akron, O.																						
Americord, non-skid	.....	.....	.....	.....	.....	.....	.....	117.75	2000	90	166.00	3000	100	213.85	4000	110	.....	....	...	.....	....	...
Baltimore Rubber Tire Mfg. Co., Baltimore, Md.																						
Box Tread, non-skid	29.39	41.88	44.65	.....	52.32	.....	68.42	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Atlantic, non-skid	23.20	36.80	39.60	.....	.....	.....	.....	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Bergougnan Rubber Corp., Trenton, N. J.																						
Bergougnan Cord, non-skid	39.60	62.50	66.80	73.35	77.65	93.10	98.00	141.00	2000	90	184.55	2700	100	239.10	3650	110	.....	....	...	.....	....	...
Brictson Mfg. Co., Omaha, Neb.																						
Brictson P. P. Studded	42.85	65.15	69.45	77.85	85.40	.....	106.50	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Braender Rubber & Tire Co., Rutherford, N. J.																						
Braender Super Cord, non-skid	.....	.....	.....	.....	.....	.....	.....	132.50	2200	90	187.35	3000	100	241.40	4000	110	.....	....	...	.....	....	...
Brunswick-Balke-Collender Co., Chicago, Ill.																						
Brunswick-Cord, non-skid	37.70	60.75	64.35	68.80	72.40	85.90	90.10	128.90	2200	90	182.30	3000	100	234.85	4000	110	.....	....	...	.....	....	...
Columbia Tire & Rubber Co., Mansfield, O.																						
Columbia Fabric	26.05	41.00	43.85	.....	.....	.....	.....	.....	....	...	.....	....	...	.....	...	...	.....	....	...	.....	....	...
Columbia, non-skid	.....	62.40	66.00	74.25	78.30	89.40	92.80	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Curtis Tire & Rubber Co., Muskegon, Mich.																						
Curtis Cord, road	.....	.....	.....	.....	.....	.....	.....	119.35	2200	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Empire Tire & Rubber Co., Trenton, N. J.																						
Empire Cord, non-skid	.....	56.55	59.60	63.70	67.05	79.55	83.40	119.35	2000	90	168.80	2700	100	217.45	3650	110	.....	....	...	.....	....	...
Erie Tire & Rubber Co., Sandusky, O.																						
Erie, non-skid	.....	.....	.....	.....	.....	.....	.....	118.00	3300	120	167.00	4200	130	215.00	5100	140	.....	....	...	.....	....	...
Falls Rubber Co., Cuyahoga Falls, O.																						
Falls Cord, neverslip	.....	.....	.....	.....	.....	.....	.....	140.00	2200	90	180.00	3000	100	230.00	4000	110	.....	....	...	.....	....	...
Federal Rubber Co. of Ill., Cudahy, Wis.																						
Federal Cord, non-skid	.....	58.75	61.95	66.20	69.75	82.75	.....	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Federal H. D. Cord, non-skid	.....	.....	.....	.....	.....	.....	91.75	119.35	2300	100	168.30	3000	110	217.45	000	120	.....	....	...	.....	....	...
Firestone Tire & Rubber Co., Akron, O.																						
Firestone Cord, non-skid	35.75	56.55	59.60	65.25	68.75	81.50	85.50	119.35	2200	90	168.80	3000	100	217.45	4000	110	272.35	5000	120	380.65	6000	130
Fisk Rubber Co., Chicopee Falls, Mass.																						
Fisk Cord, non-skid	31.15	56.20	59.45	63.50	67.05	79.60	83.50	119.35	2200	90	168.80	3000	100	217.45	000	110	272.35	5000	120	380.65	6000	130
General Tire & Rubber Co., Akron, O.																						
General Cord, non-skid	37.70	60.80	62.75	68.85	72.50	85.50	87.80	130.85	2200	90	185.15	3000	100	238.50	4000	110	298.65	5000	120	417.45	6000	130
Gillette Rubber Co., Eau Claire, Wis.																						
Gillette Safety Tread	.....	.....	.....	.....	.....	.....	.....	119.35	....	...	168.80	....	...	217.45	....	...	.....	....	...	.....	....	...
Goodrich, B. F., Rubber Co., Akron, O.																						
Goodrich Cord, ribbed	.....	.....	.....	.....	.....	.....	.....	119.35	2200	90	168.80	3000	100	217.45	4000	110	.....	....	...	.....	....	...
Goodrich Cord, Safety	.....	.....	.....	.....	.....	.....	.....	119.35	2200	100	168.80	3000	110	217.45	4000	110	.....	....	...	.....	....	...
Goodyear Tire & Rubber Co., Akron, O.																						
Goodyear Cord, ribbed	.....	.....	.....	60.50	63.70	75.60	79.25	119.35	2200	100	168.80	3000	110	217.45	4000	120	.....	....	...	.....	....	...
Goodyear Cord, All Weather	.....	.....	.....	63.70	67.05	79.55	83.40	119.35	2200	100	168.80	3000	110	217.45	000	120	272.35	5000	130	380.65	6000	140
Gordon Tire & Rubber Co., Canton, O.																						
Gordon, non-skid	35.25	58.75	60.80	69.30	75.90	85.20	92.80	140.00	2100	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Hewitt Rubber Co., Buffalo, N. Y.																						
Hewitt Cord, non-skid	.....	.....	.....	.....	.....	.....	.....	132.60	2000	90	187.50	2850	100	.....	....	...	.....	....	...	.....	....	...
Howe Rubber Co., Inc., New Brunswick, N. J.																						
Howe Ultra Cord, non-skid	.....	.....	.....	.....	.....	.....	.....	127.25	2000	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...
India Tire & Rubber Co., Akron, O.																						
India Cord, non-skid	44.85	66.60	70.25	75.00	79.10	93.65	98.25	143.20	2200	90	202.50	3000	100	295.00	4000	110	.....	....	...	.....	....	...
International India Rubber Corp., S. Bend, Ind																						
Odell Cord, non-skid	28.50	46.30	51.10	60.50	64.00	.....	75.60	119.35	2000	90	168.80	27.00	100	.....	....	...	.....	....	...	.....	....	...
Kelly-Springfield Tire Co., New York, N. Y.																						
Kelly-Springfield Cord, grooved	.....	59.75	62.50	69.75	73.25	86.00	90.00	140.00	2000	90	188.00	3000	100	236.00	4000	110	.....	....	...	.....	....	...
Kelly-Springfield Cord, B. B.	.....	64.00	68.50	73.50	77.00	91.00	94.60	140.00	2000	90	188.00	3000	100	236.00	4000	110	.....	....	...	.....	....	...
Lee Tire & Rubber Co., New York, N. Y.																						
Lee P. P., non-skid	.....	.....	.....	76.45	80.45	91.50	95.95	143.25	1970	90	202.75	2720	100	260.95	3595	110	.....	....	...	.....	....	...
Lehigh Tire & Rubber Co., New Castle, Pa.																						
Lehigh, Ribbed Fabric	22.65	35.15	37.60	46.50	49.45	53.40	56.45	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Lehigh, Non-skid Fabric	23.50	37.40	40.10	50.00	53.25	61.65	65.35	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
Long Wear Tire & Rubber Co., Anderson, Ind.																						
Long Wear, non-skid	.....	61.30	63.00	68.00	72.00	85.25	89.40	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
McCreary Tire & Rubber Co., Indiana, Pa.																						
McCreary Fabric, non-skid	25.90	39.10	43.15	54.90	57.15	.....	72.40	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
McCreary Cord, non-skid	35.75	56.00	60.45	78.60	84.95	93.20	98.55	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...
McGraw Tire & Rubber Co., Cleveland, O.																						
McGraw Cord, ribbed	32.55	59.10	62.25	66.55	70.10	83.15	87.15	131.25	2000	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...
McGraw Cord, non-skid	34.25	62.20	65.55	70.00	73.75	87.50	91.75	131.25	2000	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...

Madison Tire & Rubber Co., New York, N. Y.																								
Madison Fabric, non-skid	29.45	47.50	49.80	57.50	61.45	.....	76.45	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Madison Cord, non-skid	.....	65.50	69.00	75.50	80.00	90.50	95.90	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Manhattan Tire & Rubber Co., Mansfield, O.																								
Manhattan Fabric	26.05	41.00	43.85	.....	.....	.....	.....	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Manhattan Cord	.....	62.40	66.00	74.25	78.30	89.40	92.80	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Marathon Tire & Rubber Co., Cuyahoga Falls, O.																								
Marathon Cord, Angle	.....	62.20	65.55	70.05	73.75	87.50	91.75	120.00	2200	100	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Mason Tire & Rubber Co., Kent, O.																								
Mason Cord, non-skid	38.55	57.95	60.00	65.45	69.00	80.75	85.75	119.35	2200	90	156.10	3000	100	216.40	3750	110	.....	....	...	.....	....	...		
Meyer Rubber Co., Columbiana, O.																								
Meyer, ribbed	23.20	36.80	39.60	49.90	53.15	.....	65.35	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Michelin Tire Co., Milltown, N. J.																								
Michelin Fabric	23.00	36.90	40.00	.....	.....	.. ...	.....	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Michelin Cord	.....	55.50	58.50	63.50	66.00	78.00	82.00	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Miller Rubber Co., Akron, O.																								
Miller Cord, "Geared-to-the-Road"	35.90	59.30	62.70	66.85	70.50	83.50	87.60	125.65	2200	90	177.65	3000	100	228.90	4000	110	.....	....	...	.....	....	...		
Mohawk Rubber Co., Akron, O.																								
Mohawk Cord, non-skid	42.00	66.85	70.35	76.70	80.30	90.75	96.20	136.00	2200	90	190.00	3000	100	240.00	4000	110	.....	....	...	.....	....	...		
Monarch Rubber Co., Hartville, O.																								
Monarch Cord, ribbed	32.55	59.10	62.25	66.55	70.05	83.15	87.15	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Monarch Cord, non-skid	34.25	62.20	65.55	70.05	73.75	87.50	91.75	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
National Tire & Rubber Co., E. Palestine, O.																								
Roamer Fabric, non-skid	23.80	37.70	40.60	.....	54.50	.....	67.00	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Olympian Fabric, non-skid	23.80	37.70	40.60	.....	54.50	.....	67.00	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Roamer Cord, non-skid	.....	64.15	.....	.....	77.45	.....	96.15	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Olympian Cord, non-skid	.....	64.15	.....	.....	77.45	.....	96.15	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Nebraska Tire & Rubber Co., Omaha, Neb.																								
Super Tread	25.00	39.81	42.63	53.13	56.56	.....	69.44	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Cornhusker	26.00	41.41	44.33	55.25	58.83	.....	72.22	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Norwalk Tire & Rubber Co., Norwalk, Conn.																								
Norwalk Cord, non-skid	45.00	62.80	66.20	70.75	74.55	88.35	92.70	125.20	2000	90	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Oldfield Tire Co., Cleveland, O.																								
Oldfield Cord, anti-skid	.....	.....	.....	.....	.....	.....	.....	.....	125.30	2200	90	177.25	3000	100	228.30	3725	110	.....	....	...	.....	....	...		
Para Bell Tire & Rubber Co., Mansfield, O.																								
Para Bell, Fabric	26.05	41.00	43.85	.....	.....	.....	.....	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Para Bell, Cord	.....	62.40	66.00	74.25	78.30	89.40	92.80	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Pennsylvania Rubber Co., Jeannette, Pa.																								
Vacuum Cup, Cord	38.55	54.55	57.40	61.35	64.65	76.60	80.35	108.40	2200	90	153.25	3000	100	197.60	4000	110	.....	....	...	.....	....	...		
Perfection Tire & Rubber Co., Fort Madison, Ia.																								
Perfection, non-skid	.....	56.55	59.60	65.25	68.75	81.50	85.50	119.35	2200	90	168.80	3000	100	217.40	4000	110	.....	....	...	.....	....	...		
Pharis Tire & Rubber Co., Newark, O.																								
Pharis, non-skid	23.50	37.40	40.10	.....	53.25	.....	63.35	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Quaker City Rubber Co., Philadelphia, Pa.																								
Quaker City, plain	24.40	35.20	39.40	47.80	50.85	.....	61.00	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
T. T. T., non-skid	27.30	42.55	45.25	54.95	58.70	.....	66.80	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Racine Auto Tire Co., Racine, Wis.																								
Horseshoe Cord, non-skid	37.50	58.20	61.35	65.50	69.10	81.75	86.00	123.00	....	120	174.00	....	130	223.50	....	140	.....	....	...	.....	....	...		
Ribbed Tread	.....	55.00	57.25	.....	65.25	.....	81.00	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Racine Rubber Co., Racine, Wis.																								
Racine Multi-Mile, Cord	.....	.....	.....	.....	.....	.....	.....	117.85	2200	90	166.65	3000	100	214.75	4000	110	.....	....	...	.....	....	...		
Republic Rubber Co., Youngstown, O.																								
Republic Grande Cord, ribbed	.....	58.10	61.20	67.15	70.70	.....	85.65	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Republic Grande Cord, Staggard Tread	37.50	61.15	64.40	70.70	74.45	86.00	90.15	129.00	2200	90	182.45	3000	100	235.05	4000	110	.....	....	...	.....	....	...		
Spreckels Savage Tire Co., San Diego, Cal.																								
Savage Cord	.....	.....	.....	.....	.....	.....	.....	117.50	1900	115	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Standard Tire Co., Willoughby, O.																								
Tiger Foot, non-skid	.....	.....	.....	.....	.....	.....	.....	128.50	2200	90	178.50	3000	100	.....	....	...	.....	....	...	.....	....	...		
Stanwood Rubber Co., Inc., Elizabeth, N. J.																								
Stanwood, Whippet Tread Cord	37.50	60.50	62.50	67.00	73.00	85.00	87.75	129.00	2200	90	183.00	2300	100	235.00	4000	110	.....	....	...	.....	....	...		
Stanwood Whippet Tread Fabric	26.85	42.25	45.40	54.60	57.80	69.40	71.50	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Star Rubber Co., Akron, O.																								
Star Cord, All Star	.....	.....	.....	.....	.....	.....	.....	144.00	2200	90	192.00	3000	100	240.00	4000	110	.....	....	...	.....	....	...		
Swinehart Tire & Rubber Co., Akron, O.																								
Swinehart Cord, Hexagon	24.75	56.55	59.60	63.70	67.05	79.65	83.40	119.35	2000	90	168.80	3000	120	.....	....	...	.....	....	...	.....	....	...		
Trent Rubber Co., Trenton, N. J.																								
Trent Fabric, non-skid	26.20	40.35	42.85	51.60	55.70	65.45	70.30	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Trent Cord, non-skid	38.00	58.30	62.20	66.15	70.40	83.50	87.40	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Tropical Tire & Rubber Co., New York, N. Y.																								
Tropical Fabric, non-skid	26.45	42.05	45.10	56.25	59.90	69.35	73.50	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Tropical Cord, non-skid	34.10	62.20	65.60	70.00	73.75	87.50	91.74	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Tyler Rubber Co., Andover, Mass.																								
Tyer Fabric, non-skid	24.15	37.00	40.25	50.60	54.25	.....	65.95	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
Tyer Cord, non-skid	.....	60.90	62.90	67.90	70.90	84.40	87.90	.....	....	...	.....	....	...	.....	....	...	.....	....	...	.....	....	...		
United States Tire Co., New York, N. Y.																								
U. S. Nobby Cord, non-skid	.....	.....	.....	.....	73.85	.....	91.75	119.35	2200	90	168.80	3000	100	217.45	4000	110	272.35	5000	120	330.65	6000	130		

Southern Plants Transplanted to Northern Estates by Motor Truck

A PHASE illustrating the utility of the motor truck not commonly known is that of transporting box-wood plants. The business of transplanting shrubbery cultivated in distant regions to the estates of the wealthy has been going on for some time past. Careful handling and skill have been found to be necessary perquisites in transporting landscape plants from old southern gardens and ancestral homes to the estates of northern millionaires. Lewis & Valentine, landscape architects of New York City, who are said to have "cornered" the box-wood market of the country transport most of their precious weight by motor truck.

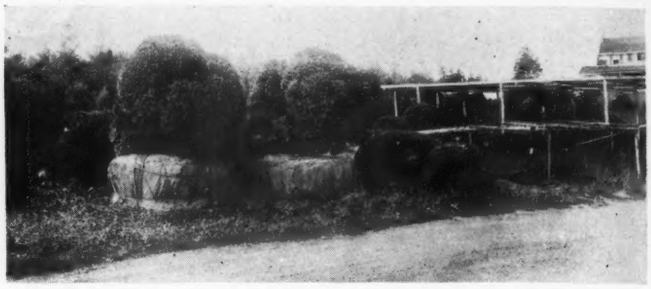
The demand for old box-wood has increased as the supply has diminished until now 70 per cent of the old box-wood of the South, it is said, is now beautifying the fine estates in the vicinity of New York. The difficulties of transporting the plants may well be realized when it is stated that they attain a size anywhere from seven to fourteen feet in height with a spread of from fifteen to thirty feet. The task, it will be seen, is no easy one, for the plants are very old, ranging from 100 to 250 years, and their value varies with their age and size.

Perhaps the biggest problem these landscape architects had to tackle was the removal of a box hedge from an estate in West Virginia near the Pennsylvania line. The box-wood was purchased by John D. Rockefeller from an ancient home, but the size was so enormous it was deemed inadvisable to try and transport it. It was later purchased by Lewis & Valentine, who divided it into huge sections, and hauled it North by motor truck.

On its arrival North it was again separated into segments and sold to the owners of various handsome estates on Long Island, the greater portion going to Captain Francis R. Meyer, president of the France and Canadian Pacific Steamship Company, and moved to his summer home at Hewlitt, L. I.

One factor that adds to the difficulty of transplanting and transporting box-wood is the necessity of retaining a large ball of earth about the roots in order to protect them from damage and to keep them moist during transportation. The roots are first securely wrapped in stout canvas and as they are frequently of the same dimensions as the tree itself, a larger amount of space than that afforded by the ordinary box-railway-freight-car is required. For this reason, as well as for the protection of the precious branches of the tree itself, the motor truck was considered preferable and when tied to the truck by a heavy hemp cable rope, the plants are as safe as if still reposing in their native soil.

Not only box-wood but bay-trees for landscape decoration are also hauled nowadays by motor truck and perhaps the most interesting feat of this sort was the removal of some fine bay-trees by Lewis & Valentine from the handsome estate of the late Captain Delamar, of Glen Cove, Long Island, to the estate of E. T. Stotesbury at Chestnut Hill, Philadelphia, Pa. The plants, which measured fifteen feet high with a spread of fourteen feet and weighed between three and four tons, were taken a distance of 125 miles by motor truck and delivered in twelve hours, record time, without a scratch. The G. M. C. trucks, of which there were three, were accompanied on their journey by a touring car in order to superintend the trip and decide which of the trio arrived first that it might receive the prize which the firm offered for the winning truck. As it happened the three came in at the same time so the prize money was divided between them.



Box-Wood Plants Fourteen Feet High Bought by John D. Rockefeller.

They were transported from W. Virginia to Long Island by motor truck under the direction of Lewis & Valentine, landscape architects of New York City.

Showing the Method Employed in Preparing Box-Wood for Motor Transportation

The roots protected with earth are securely wrapped in stout canvas. The entire plant is then lifted by tackle out of their cradles onto the motor truck

Farmers Replacing Farm Labor With Trucks

According to J. O. Peet, sales representative of the Napoleon Motors Co., Traverse City, Mich., and who is traveling around the country in his office truck, the farmer is not as bad off as he is pictured. Mr. Peet has made a careful investigation of conditions among farmers.

"There is no need for the alarm of some of our intellectual commentators on farming conditions. This talk of the reduction in production on the farms through the decrease in farming population is so much nonsense," said Mr. Peet. "I have found that the farmers are replacing much high-priced farm labor and overcoming lack of the old-time working force of small salaries, with motor trucks, motor tractors and automobiles, all time savers and efficient aids in present crisis.

"Fewer men on the farms does not mean decrease in production under present circumstances. Farmers are more contented and more prosperous. They are raising increased quantities of staple crops and are reaching the market more quickly with their product through the use of motor trucks. They are farming more land through the use of tractors.

"In my work I have kept away from large cities for night stops, have driven into farmyards and bunked in my roomy office and sleeping room when converted, and have found ample opportunity to learn that with the motor truck, motor car, motor power to pump water, to run the feed cutters, the wood saws, and to do any and all power work; and with the telephone, rural free delivery, improved roads, and many other additions to life in the farming communities, the farmer is all right and happy. He is a market for trucks that is all too often overlooked in systematic work by sales representatives of companies."

Heaters in Trucks Solve Many Owner Problems

By C. S. PELTON, General Manager The Perfection Heater & Manufacturing Company

ASSUMING that heaters for motor truck cabs are soon to become standard equipment, and we heater enthusiasts stoutly maintain that this will be true, the procrastinating driver must now find some new cold weather alibi to replace his ancient but popular excuse that he had "just stopped in to get warm."

In other words, the driver will be warm, as he rides, irrespective of weather conditions.

The truck owner, too, will observe to his utmost satisfaction a gratifying decrease in the gasoline expense of his heater-equipped truck. No longer will the engine run wild while the driver is toasting his shins in the nearest pool room. His shins will not need toasting and he will have a regular schedule to fulfill, cold weather to the contrary notwithstanding.

In brief, the foregoing are two of many highly important advantages quoted in favor of the modern type of car heater.

The advent of the motor truck into the list of heater equipped conveyances required about the same length of time as that which expired before the adoption of improvements of similar nature in other kinds of vehicles and common carriers.

For example, street cars were operated in the early days without much thought concerning the comfort of the motorman and passengers. All attention was paid to the operating costs of the car—would it be a financial success from the standpoint of the operator? The latter question troubled the street car men much more than the matter of comfort.

Car Makers Had Other Problems

The same was true to some extent with passenger cars. When, a few years ago, I discussed the heater subject with a prominent manufacturer he laughed and said: "Don't talk heater to me. I've got bigger car problems than that. If the passengers get cold, let 'em use the old fashioned soapstone. They got along alright with it when they rode in buggies."

That same manufacturer is today equipping every one of the thousands of cars he turns out annually with heaters. More than forty-five other passenger car makers are doing likewise. The heater has come to be an essential accessory on every car where comfort is a pronounced feature.

While truck manufacturers have been developing their product in an engineering and mechanical way, the operators of trucks have been cursing the cold-weather driving situation. It has not only been difficult to obtain drivers in the winter months, but those who accepted such employment spent a considerable part of their time in getting warm, and, no wonder—the unheated motor truck cab, in the winter months, is just about as cold and undesirable a place as one would care to occupy for a few minutes—not to mention several hours.

Efficiency is Demonstrated

Examples of motor truck heater efficiency are almost too numerous to mention. One of the largest and best known passenger car manufacturers demonstrated the advantages of this heater equipment to their complete satisfaction during the war when passenger car production had been cut to the minimum by war conditions, this company began seriously considering truck production. A number of experimental trucks were turned out and some of them carried heater installations in the driver's cab.

It was not long before the factory officials discovered that the testing drivers all insisted on the heater-equipped trucks. Furthermore, the records showed that the testers were running up twice as much speedometer mileage in the winter months with the heated trucks as they did with the non-heated machines. The signing of the armistice terminated their truck building activities, but this company is now the largest single user of Perfection Heaters in their passenger cars.

The Heat of the Exhaust is Utilized and the Radiator Itself Offers No Obstruction to the Driver

The Northway Motors Corp. had similar experience and now heaters comprise a part of their regular equipment in truck cabs.

The Perfection Heater and Manufacturing Co., of Cleveland, has spent seven years in the development if its product and today the factory is pointed out as one of Cleveland's model industrial plants. This company recently moved into a large new factory, which is equipped throughout with the latest and best specialized equipment for quantity production.

There are six different types of Perfection Motor Car Heaters—various styles and designs to fit the various makes of cars. Two types especially suitable for motor trucks, are known as the "DW" and "DWS." The design is identical except in length.

The heating principle is the same for all types—simply the utilization of exhaust gas that otherwise would be wasted.

A valve is attached to the exhaust pipe just forward of the muffler. This valve is operated by a lever conveniently located. When the valve is opened, a portion of the hot exhaust gas is deflected through flexible steel tubing to the heater radiator. In the radiator, it is distributed through horizontal gas tight tubes and then passes out into the open air underneath the car.

One fact that should be thoroughly understood is this—the modern car heater is in no sense of the word a mechanical toy. Its construction requires a considerable amount of engineering and technical skill. On certain types of Perfection Heaters, there are 103 separate and distinct machining operations, many of them as fine as one thousandth of an inch.

Has the Right Idea

A more or less obscure salesman in a more or less obscure section of the Middle West has the right idea that eventually will land him in the swivel chair and the five-figure salary. The report comes to us how one of his dealers in a small town has profited amazingly by this salesman's constructive ability and dogged determination to make his dealers successful in spite of themselves.

This dealer is located in a territory where he has stiff competition from larger nearby towns. It soon became apparent to the salesman aforementioned that if he was going to get any worthwhile orders from the dealer, it must be done by showing him how to go out and dig up his trade. This he did in approved style, urging big orders to give the dealer an interest in the goods, special sales, advertising in the weekly newspaper, clever store displays, and, most resultful of all, a mailing list and a canvassing plan to get his goods directly before the buyers.

The result has been that this dealer, located in a small town, in a sparsely settled district, is doing a business much larger than many more fortunately situated competitors. And sizable orders for the product handled by the alert and progressive salesman constantly are received by his sales manager.—*The Denbyman*, Denby Motor Truck Co., Detroit, Mich.

Large Western Telephone Company Employs Five-Trailer Trains in Its Construction Department

THE Pacific Telephone & Telegraph Co., California, has found extremely satisfactory a new method of forwarding their construction program by the utilization of five-unit-trailer-trains, which it has bought from the Edward S. Crawford Motor Co., Sacramento, Cal., a dealer of the Utility Trailer, manufactured by Los Angeles Trailer Co., Los Angeles, Cal.

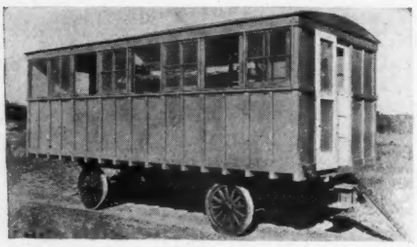
This latest and most unique trailer development instituted by the Pacific Telephone & Telegraph Co. has resulted in great savings to its construction department. The old method employed by this company involved frequent breaking of camps at an average cost of $200, when it followed a large job. With the present equipment, which can be hooked together and started on its way in less than an hour's time, not only is much time and expense saved, but little work is necessary upon arriving at its destination along camp-pitching lines. As these encampments only last about one day the big savings in every respect can be readily appreciated. Another very important consideration incident to the new equipment are the sanitary features and the comfort which can be afforded the men while on the road. The bunk houses are equipped with steel folding double cots, which can be removed to permit the cleaning of the entire interior of the car with a hose. Comfort and convenience has been the main thought in the construction of these trailers, in addition to economy of transportation and encampment. Although the approximate cost of this trailer outfit complete is in the neighborhood of $40,000, experts maintain that this is a comparatively small investment considering the resultant labor and money-saving features.

Of the many provisions of equipment and convenience, not the least is the fact that complete cognizance was taken of the fact a fully equipped cooking and dining car were essential. The cook house is 25 ft. long, 8½ ft. wide. It is mounted on a specially constructed 2-ton double end steer trailer, and its interior equipment consists of an oil burning stove, hot and cold water tanks, water sinks, and drain boards, sugar and flour bins, ice chest and cooking paraphernalia. The oil for the stove is carried in a large tank beneath the trailer, alongside of which is also a 40-gal. hot water boiler. Auxiliary supply tank is also provided and is located in the roof of the kitchen compartment. The kitchen proper takes up about one-third of the floor space, the other two-thirds is devoted to the dining room. The dining room contains a long horseshoe counter with ample moving room in the aisle for the waiter. There are seven stools on each side, providing a seating capacity for fourteen men. The office and supply wagon is divided into two parts, one-half being devoted to the headquarters for the foreman and assistant and the other half to storage space for small supplies.

The bunk houses, which are of the same general dimensions, provide comfortable sleeping accommodations for from six to eight men; however, in an emergency, ten or twelve men can be taken care of. In one corner is a cold shower and a wash basin, which are supplied from a 40-gal. tank in the roof.

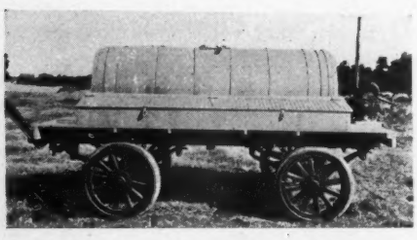
The fifth car in the train is devoted exclusively to the carrying of water and consists of a huge water tank, which acts as a reserve for replenishing the smaller tanks when the water in them has been exhausted.

In summarizing might be added that of greatest importance is the fact that this train is complete in every respect—cooking and dining cars, sleeping cars, office equipment, special water car, and arrangement for the transportation of tools and special instruments that are necessary in this kind of work. This arrangement warrants continuous carrying on of company lines that are so vital in the work of a large public utility corporation. It is a well known fact what wonderful strides motor equipment has taken over the old-fashioned horse-drawn service wagon employed by construction gangs in bygone days. Today, when construction is on a greater plan that ever before in history, equipment is a vital issue. To this end the installation of these trains is in a measure a remarkable step forward in the realm of progress.



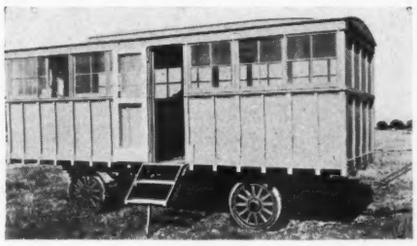
A Full View of the Combination Sleeping and Office Car

The front end is devoted to sleeping quarters and the rear end is used exclusively for office space and housing of tools and instruments while enroute.



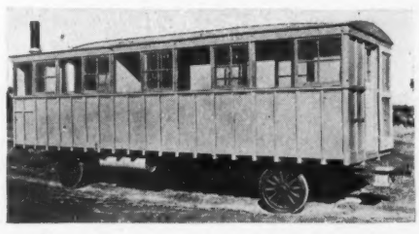
Showing the Construction of the Four Hundred Gallon Tank Water Car

It is provided with a centrifugal pump, making the drawing of water quick and convenient. This tank insures a fresh supply at all times.



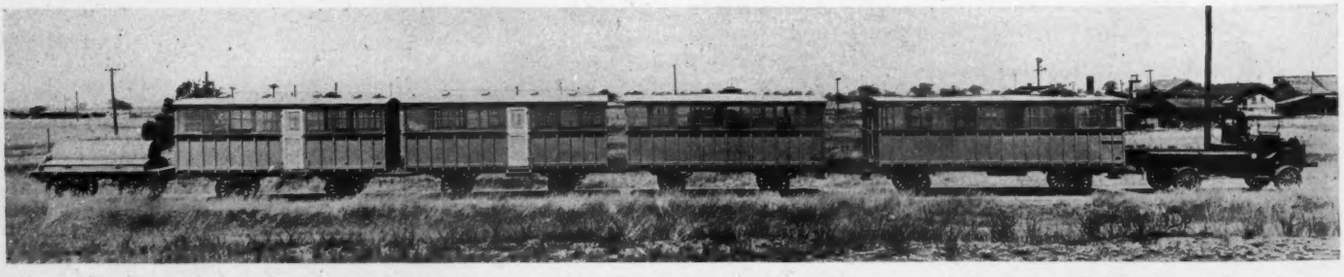
Showing the Side-Door Sleeping Car Used Exclusively for Sleeping Purposes

In it are arranged berths providing each man with an individual bed. A shower bath and wash basin are also installed.



View of the Dining and Cooking Car, Which Has a Seating Capacity for Fourteen Persons

The front compartment is devoted to cooking and the remaining space is devoted to dining

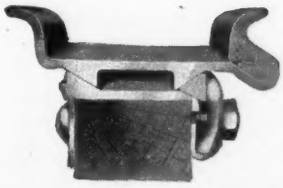


A Complete View of the Big Trailer Train Rambling Over a Highway of Northern California

The detail of coupling is taken care of in a very effective manner. This device has been found satisfactory, having functioned properly in the mountainous sections of this country, which in itself is an extreme test. This train is said to make sharp curves accurately and safely

THE "Ask the Man Who Owns One" Packard CO. ~~ DETROIT

THE Packard business is a business of building trucks for the man who wants transportation every working hour of every working day.—*Recent Packard Advertisement.*



Type C. Continuous base detachable demountable rim for trucks. This type of rim in the 6, 7, 8 and 10-inch sizes is the rim which has made the use of Giant Pneumatic truck tires practical.

So Packard equips for Giant Pneumatic tires with Firestone Quick Detachable Demountable Rims. Packard owners get the utmost in tire wear, for these rims lock the tire as in a vise—the continuous base, clamped on in continuous contact with the felloe, keeps the tire in perfect alignment, prevents side sway and road shocks and gives greater tire mileage and safety.

One man can change Giant Tires when trucks are equipped with Firestone Quick Detachable Demountable Rims—a convenience that shows results in the final haulage costs.

The better trucks use Firestone Quick Detachable Demountable Rims. "Firestone" is stamped on every rim. Available in sizes from 30x3½ up to 40x10 inches.

The Firestone Steel Products Co.

Firestone Park, Akron, Ohio

Firestone

Quick Detachable Demountable Rims

Truckportation Receives Great Impetus by Boosting Efforts of Enthusiastic Hoosier Dealers

By WILLIAM EDWARD HAYES

As a direct result of enthusiastic public opinion in the motor truck as a solution to transportation problems, the truck dealers in Indiana have received an added incentive to push a plan already followed to some extent in the mapping out of a large truck transportation system.

Consistent publicity has brought the Hoosier dealer in touch with the exact sentiment of the Hoosier populace on the transportation problem, which is poor in Indiana. However, despite these present negative transportation conditions, which will be remedied when the new system goes into effect, it is predicted that the coming year will see the sale of trucks for the year previous doubled.

System to be Enlarged

In experimenting in the past with a transportation system in this state which would serve to bring over 15,000 Indiana merchants from rural districts and cities alike to Indianapolis, the center of Hoosier production, the results have been such as to induce every truck dealer to boost to his utmost ability an enlargement of plans, which already have been laid out by the auto association and the Indianapolis Chamber of Commerce, for a more effective transporting organization. The dealer is quick to recognize the opportunity for a greater publicity, and thereby a greater benefit to himself, not only in the sales he will make, but in the large amount of good he will do his community with rendering a consistent sales service.

The motor truck was first put into service in Indiana as an aid in transportation when the return loads bureau was organized by the Indianapolis Chamber of Commerce and the Indianapolis transfer industry during the war. This system paved the way for a complete network of well-built county and township roads, over which these trucks are now humming daily with their freight.

Hoosier production, growing so rapidly that transportation has for some time been one of the most serious problems that manufacturers have had to face, will be increased, distribution will be better, and the producer and consumer will be brought closer together when truck operations get fully under way. This is particularly true in the matter of short haul freight.

There will be no effort made to compete with the railroads, for their service in the long haul is fully recognized.

As evidence, however, of the good will, railroad officials bear toward the truck in the transportation game, Daniel Willard, president of the Baltimore & Ohio Railroad, said:

"I think I realize properly the importance of the motor truck transportation and I believe it to be to the best interests of the country as a whole that such transportation be further developed along economic lines.

"I think there is a very proper economic field for all agencies of transportation so far developed, and wherever it can be clearly shown that the motor truck can perform the transportation service required at a total economic cost lower than railroad cost, then in the public interest the motor transport system should be used.

"The railroads and the motor truck have their own sphere of economic usefulness, and, in my opinion, it should be a mistake for either one to extend its influence and activities beyond the economic limits clearly established."

The Indiana truck dealers and the Indiana State Automobile Association are convinced that the truck system on a big scale for the transporting of goods will be as generally beneficent as the present limited and uncertain transportation by rail is burdensome.

Already Indiana coal shipments are slowed to such an extent that many industries are in constant fear of having to cease production for short periods. This is particularly true in the automotive manufacturing end. So many firms were crippled by the succession of Indiana mine strikes that they have never been able to get a surplus supply of coal put in. And it is in the matter of transporting coal, for one thing, from the Indiana mines that the truck field is looking forward to with interest.

Dealers, however, are of the belief that the farmer, after all, is displaying the greatest interest in the truck as a transportation unit. Indiana soil, fertile, has made business men out of many a farmer because of the increasing demand for businesslike methods in handling grain and produce. The farmer now depends on the motor truck in Indiana, as he used to depend on the four-horse team and a one-ton wagon. He realizes the particular advantage of the truck on a rush live-stock or perishable products run to the market. The farmers are using their trucks now to haul their perishable freight direct to their local markets, and they are utilizing their trucks to further service by loading up with package freight for merchants in their communities on the return trip.

These facts are having a great bearing on the advertising policy of Indiana truck dealers. They realize the broad angle they have to work from, and the encouragement they are receiving from the general public more firmly sets them to the purpose of getting everything there is to be had out of the extremity of the Indiana transportation problem.

These dealers are interested in co-operating with dealers in other states on any ideas they may have which would be helpful in enlarging on the idea of the transportation system. Hoosier dealers feel that never was an opportunity riper for firmly advocating this method of transportation than now.

The Hoosier State Automobile Association is now outlining a comprehensive policy for the securing of better roads, and improvements and maintenance of county and township highways.

With Equipment Such as This Long-Distance Furniture Hauling Loses Much of Its Hardships

This de luxe moving van, in the service of Warner & Co., Boston, moving packers and movers, consists of a special enclosed body, mounted on a 3½-ton White chassis. Designed for long hauls, between Boston and Philadelphia, New York, Washington, Baltimore and other points, the truck is fitted with sleeping quarters for three men. This enables the truck to be on the road night and day, one man driving while his relief drivers are sleeping. The body is constructed without the interior padding common to furniture trucks. Removable boards divide the storage space into compartments. Arrangements are made for tying the load through apertures in the bottom of the body. The driver's compartment, which includes the berths, is completely enclosed. The entire car is fitted with electric lights. The complete furnishings of a six-room house can be loaded into the van at one time, 1000 cu. ft. of cargo space being available.

Building Its Own Road Bed
— *to Haul America's Freight*

The transportation problem of America will eventually be worked out—not on steel rails only, but on hard pike roads; not with engines and box cars only, but with motor trucks and trailers. This means more roads—better roads. The motor truck is today helping to build better roads that it may use them to the benefit of the community.

Ross Steering Gears are playing an important part in this work. The exclusive screw and nut design provides an enormous bearing surface. This bearing surface, in turn, means greater efficiency, greater safety and reliability, and easier steering—both in the motor trucks that are employed in building the road-bed and in those which later will haul freight and express over it. Ross Gears are now standard equipment on 418 different truck models from 165 different manufacturers.

Further Information Furnished on Request

ROSS GEAR & TOOL COMPANY
760 Heath Street Lafayette, Indiana, U. S. A.

ROSS STEERING GEARS

THE STEERING GEARS THAT PREDOMINATE ON MOTOR TRUCKS

Electric Truck in New York City

By EUGENE W. ROESCH

ARGUMENTS for and against the electric truck as a means of urban haulage have long been debated, but in the light of present facts, figures and events, the evidence clearly proves that more and more recognition is being accorded this type of vehicle. Sales records to date for the current year in New York City show an increase of 341 per cent over the twelve months of 1919. The number of electric trucks has been augmented by 428 in the metropolitan district alone and that their field of usefulness is not confiend to any particular industry or industries is indicated by the fact that the trucks range from one-half to six tons and are in use by fifty-seven different firms, the average size per car is slightly over one ton.

The problem confronting the Central Station is easily recognized when it is seen that 1,797,600 KWH of current will be necessary to charge this fleet and when it is further realized that this total represents an increment of 237 per cent over the preceding year. However, the service stations and indeed all those interested in the future of electric trucks, are expanding their organizations and are making every effort to adequately cope with the situation. To such good purpose is this being done that facilities for the care and maintainance of electric vehicles have been and will continue to be always available. Last year 72 per cent of the trucks on the city streets used Central Station service while this year 77 per cent of the total are charged by this means. Naturally this factor has operated to bring about increased production by those companies manufacturing electric current. Thus not only are the companies themselves benefited but the owners of the storage battery trucks have a service placed at their disposal which was formerly impossible.

A very significant landmark that greets the observer when covering the ground of electric truck sales during the nine months just elapsed is the number of original owners. The figures indicate that 17 of the purchasers are using electric vehicles for the first time while in 1919 only 8 of the trucks were sold to new users, an increase of 112 per cent.

Competent authority has asserted that 80 per cent of all gasoline trucks in New York City could and should profitably be replaced by electrics. Stop and consider what this means. There are at present 42,000 gasoline trucks in the metropolitan district. Suppose not that 80 per cent but that 21,000 or 50 per cent of these can be replaced by electrics. The average cash saving of electric vehicles has been determined at $8 per car per day but, in order to be sufficiently conservative and escape any criticism let us say that it is $4. Multiplying 21,000 by $4 we have $84,000 which, extended over 300 yearly working days, becomes $25,200,000 or the interest at 6 per cent of $420,000,000. In other words, the supposedly astute New York business man is deliberately allowing the interest on nearly half a billion dollars to slip through his fingers yearly. And this takes in the monetary saving only, to say nothing of increased efficiency, relief of traffic conditions and added cleanliness plus the lowered fire insurance charges on the buildings housing the electric truck.

The staggering total of these figures gives some idea of the task confronting the truck manufacturer, the salesman, the battery manufacturer and the Central Station. Far from being dismayed, however, these organizations are going ahead and are continually devising means to surmount and conquer the obstacles in their path. Central service stations are widening their capacities, manufacturers are speeding up production and those men who come in personal contact with the buyer are studying the best means of conviction and approach. Advertising campaigns by the storage battery companies are also making their influence felt and the future of the electric vehicle industry is assured. The results shown by the sales record for 1920 are not only encouraging but display with absolute certainty the fact that the electric truck has come into its own as the best, most economical and most efficient means of city haulage within its proper sphere.

When Will They Stop Overloading?

Prompted by recent propaganda alleging that overloaded motor trucks were mainly responsible for damage done to highways, the Parker Motor Truck Co., Milwaukee, investigated local conditions bringing out some very interesting facts. Covering a period of 10 days, those trucks observed being overloaded or over speeded were recorded, there being a total of 31 such trucks noted during that period.

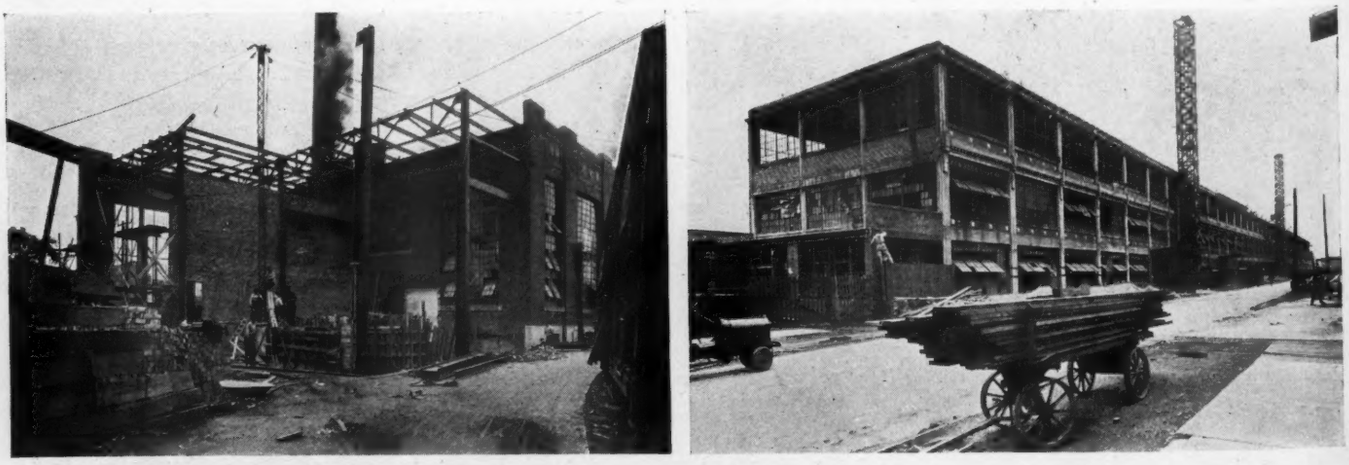
Twenty-two were overloaded and the remaining nine were over-speeding. Happily none of the overloaded trucks were traveling at more than a moderate rate of speed. While these 31 trucks represent a very small portion of the total number operating in the city, it is true that some truck owners are at fault in this respect.

The worst case of overloading discovered was that of a five-ton dump truck carrying eleven tons of scrap steel. What can that owner gain by burdening a five-ton truck with an eleven-ton load?

True, his present profits may show increase without any apparent damage being done to the truck, but such constant overloading will soon result in an increased operating expense and a decided shortening of the truck's period of usefulness.

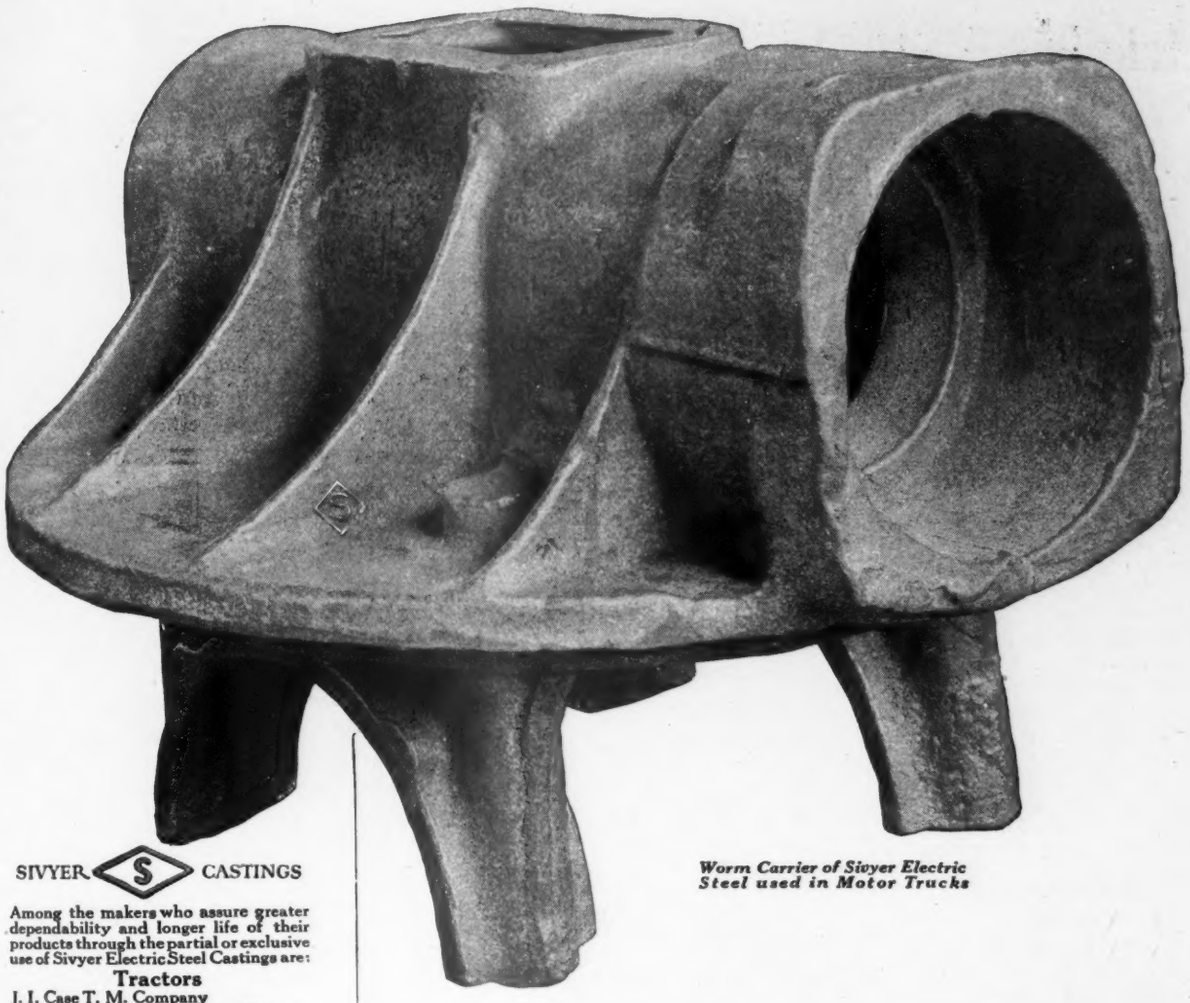
The proper size of tire necessary to handle capacity loads is determined by skilled engineers and when trucks are overloaded, is it any wonder that tires go to pieces or that trucks are charged with damaging pavements?

There is hardly a single part but what suffers when the truck carries an excessive cargo. Bearings, wheels, axles, springs, frames and transmission become worn and in the end owner pays for his bad management in diminished truck life.



Additions to the Continental Motors Corporation's Detroit Plant Almost Completed

The new additions to the plant include housing facilities for three extra boilers, an air-compressor set and a Corliss generating set—all designed to provide the necessary increase in power to care for big additions to the plant's manufacturing facilities as well as to render it independent of outside power sources. The illustration on the left shows this particular addition under construction. The extension to the west wing of the plant, view of which is shown at the right, is to be devoted exclusively to the manufacture of spare parts for Continental six-cylinder engines. This latter feature should be of unusual interest to Continental-equipped car and truck builders, dealers, garage men and the public, for it means an always available supply of Continental parts from a department separated from the ordinary production end of the business but equipped with the same facilities for supplying any unit of the completed motor.



Worm Carrier of Sivyer Electric Steel used in Motor Trucks

SIVYER CASTINGS

Among the makers who assure greater dependability and longer life of their products through the partial or exclusive use of Sivyer Electric Steel Castings are:

Tractors

J. I. Case T. M. Company
Dart Truck & Tractor Corporation
Electric Wheel Company
General Ordnance Company
Holt Manufacturing Company
Huber Manufacturing Company
Illinois Tractor Company
International Harvester Company
Keck Gonnerman Company
John Lauson Manufacturing Company
Minneapolis Threshing Machine Co.
Peoria Tractor Corporation
Port Huron Eng. & Threshing Co.
Samson Tractor Company
Turner Manufacturing Company
H. A. Wetmore

Trucks and Automobiles

Dart Truck & Tractor Corporation
Diamond "T" Motor Car Company
Federal Motor Truck Company
Forschler Motor Truck Mfg. Co.
Menominee Motor Truck Company
Nash Motors Company
National Motor Car and Vehicle Corp.
Parker Motor Truck Company
Reo Motor Car Company
Service Motor Truck Company
Sterling Motor Truck Company
Velie Motors Corporation

Engine, Parts and Implement Manufacturers

B. F. Avery & Sons
Deere & Company
Falls Motor Company
Foote Bros. Gear & Machinery Co.
Grand Detour Plow Company
Jaxon Steel Products Co.
Midwest Engine Company
R. D. Nuttall Company
Wisconsin Motor Manufacturing Co.

Uniformly Sound Parts

SUCCESSFUL solutions of the molding and riser problems involved in making such parts as worm carriers are typical of Sivyer Castings. Proper coring out, and the avoidance of shrink holes and cracks where the thin parts join the thick, mean much to the truck manufacturer in the matter of reduced machining costs. And they mean still more to him, and to the user of his product, by making sure of strength and long life.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

The Latest; a Shower Bath Motor Truck

ONE of the newest things in motordom is a completely equipped shower bath motor truck, which has been designed by the Republic Motor Truck Company, for motorized circus companies, military motorcades making long cross country runs, and for truck development tours throughout the United States. The novel truck made its first appearance on the recent Michigan Pikes Tour, conducted from Detroit through Ontario and northern Michigan. It has dressing and locker rooms, eight shower bath heads, and automatically operated devices to keep the large water tanks constantly filled with hot water so as to make the showers available at any time.

While originally designed for this tour alone, the truck has proved its practicability and will undoubtedly be used in future tours and probably for service with tent shows where shower baths cannot be obtained in any other way.

The truck used is two and one-half ton Republic model. The special body is of a moving type. The front compartment of the body is arranged for a dressing room and is separated from the shower bath compartment in the rear, by a partition and connecting door. The dressing room is six feet wide and seven feet long and fitted with three lockers, while the shower bath compartment is 6 x 7 feet in size and contains eight separate shower heads, all arranged to be operated independently. The floor slopes from the outer edge to the center so as to drain out the water, and is covered with heavy rubber tiling.

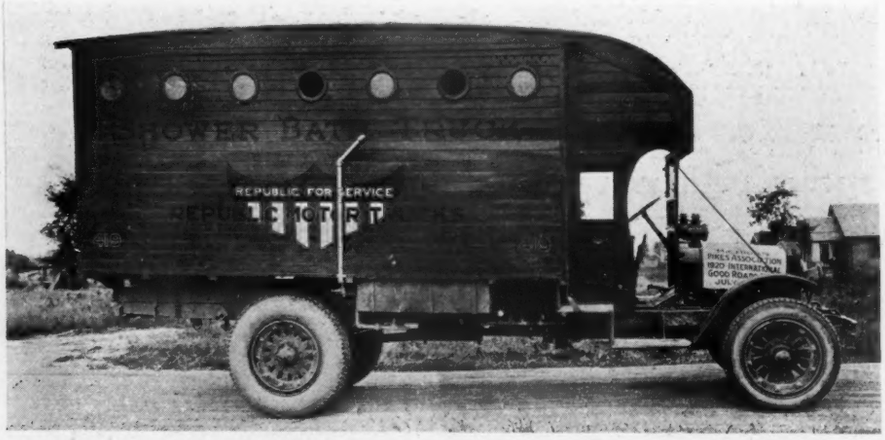
A telescoping trough beneath the body catches the water and carries it to the rear when the showers are in use. The compartments are lighted by small round opaqued windows resembling port-holes, and by three electric ceiling domes. The inside of the body is natural wood, the wood having been saturated with two coats of oil before being given two coats of waterproof varnish.

Two water tanks are carried under the body with a total capacity of 400 gallons. These are piped to a small 25-gallon rotary gear pump, the pump being mounted under the chassis frame and driven from the transmission by a power-take-off, but driven independently of the transmission and operated by a lever and small gear. The large tanks are filled by means of a large suction hose carried on the truck.

By means of a special system connected direct to the supply tanks, the water is kept at a temperature suitable for the baths. The water is drawn from the bottom of the tanks through a series of pipes to the heater, and returned to the top of the tanks, thus keeping a supply of hot water in the tanks at all times.

The truck already having proven practical, it may be expected to take its place in motorized truck movement tours throughout the country.

The shower bath truck attracted attention all through Ontario, as nothing of its kind had ever been seen before. Dealers and even manufacturers visited the camping place of the motorcade and specially examined the shower bath truck to see how it was operated. Eight men could take a shower at one time. It required about five or eight minutes to heat enough water before the second relay of eight men could take their baths.



The Utility of a Motor Truck is Illimitable, Even Traveling Shower Baths Are in Vogue

This Republic truck, furnished with shower baths, accompanied the recent Pike's Peak Caravan

Rail Rate Increase Should Reduce Living Costs

THE subject of the recent raise in railroad freight rates and its effect upon prices is uppermost in the minds of shippers and receivers of goods and the consuming public as well. On first thought it would appear that any increase in transportation rates would mean a corresponding increase in the cost to the consumer of the materials transported. However, in a recent address to the members of his organization, R. E. Fulton, vice-president of the International Motor Company, took exception to this popular idea and showed why the increase should, in reality, reduce the cost of living.

"Expensive transportation is far cheaper than no transportation," said Mr. Fulton. "To a very large extent, the present high cost of living is the result of attempting to carry on transportation at rates which did not allow the railroads sufficient revenue to maintain adequate service. Many of the apparent shortages which have forced up prices have been the result of inability to move goods to markets. Likewise, interest on capital involved in commodities tied up by lack of transportation facilities, must be included in the final price of all articles delayed in transit. The waste of perishable commodities is another important addition—a recent Congressional investigation proved that fully 50 per cent of the perishable food products of America are wasted through insufficient methods of transportation. If giving the railroads adequate compensation for their service will aid to establish an uninterrupted flow of merchandise from the producer to the consumer, then a general lowering of prices is bound to result, and the cost of maintaining such a steady flow will be nothing as compared to the price the country has already paid for inadequate transportation.

"It is the same way with motor truck transportation. Every dollar spent to build adequate highways is an investment in lower commodity prices. On the other hand, any unjustified restriction or discouragement to economical hauling such as that offered by larger capacity trucks, is just as poor business as to handicap railroad freight transportation. And unfortunately, most of the legislative effort along this line has been unjustified since it has been based on the mere assumption that large capacity trucks wear out the roads simply because they are heavier. Legislators fail to realize that the use of trucks of half the capacity for the same loads means two trucks instead of one and, therefore, more trucks on the highway as well as far greater costs for the transportation of goods. And even then road wear would be increased because the use of lighter trucks means higher speed and the degree of road wear is proportionate to the rate of speed. More important still is the fact that the weight of vehicle in proportion to carrying capacity decreases as the size of the truck increases. Therefore, when several smaller trucks are used instead of a single large truck, the roads are forced to hold a far greater amount of useless vehicle weight which adds to road destruction.

"Transportation is over-expensive only when it is wasteful. Whether the mode of transportation is via railroad or motor truck, it is false economy to base development upon common assumption when a little foresight and careful study will be reflected in freedom of traffic, less waste and consequently lower commodity prices."

Is there one *best* truck?

The Engineer's Answer

(From an interview with the Chief Engineer, Atterbury Motor Car Co.)

"I do not think it would be fair to say that any truck, not even the Atterbury, is the 'one best truck'.

"But I am absolutely certain that no other motor truck built today, embodies in its design and construction, more careful thought, skill and experience than the Atterbury.

"And if, after our eleven years of continual specialized experience in building Motor Trucks, we knew of a single point where the Atterbury could be fundamentally improved, we would adopt that improvement, regardless of trouble or expense to ourselves."

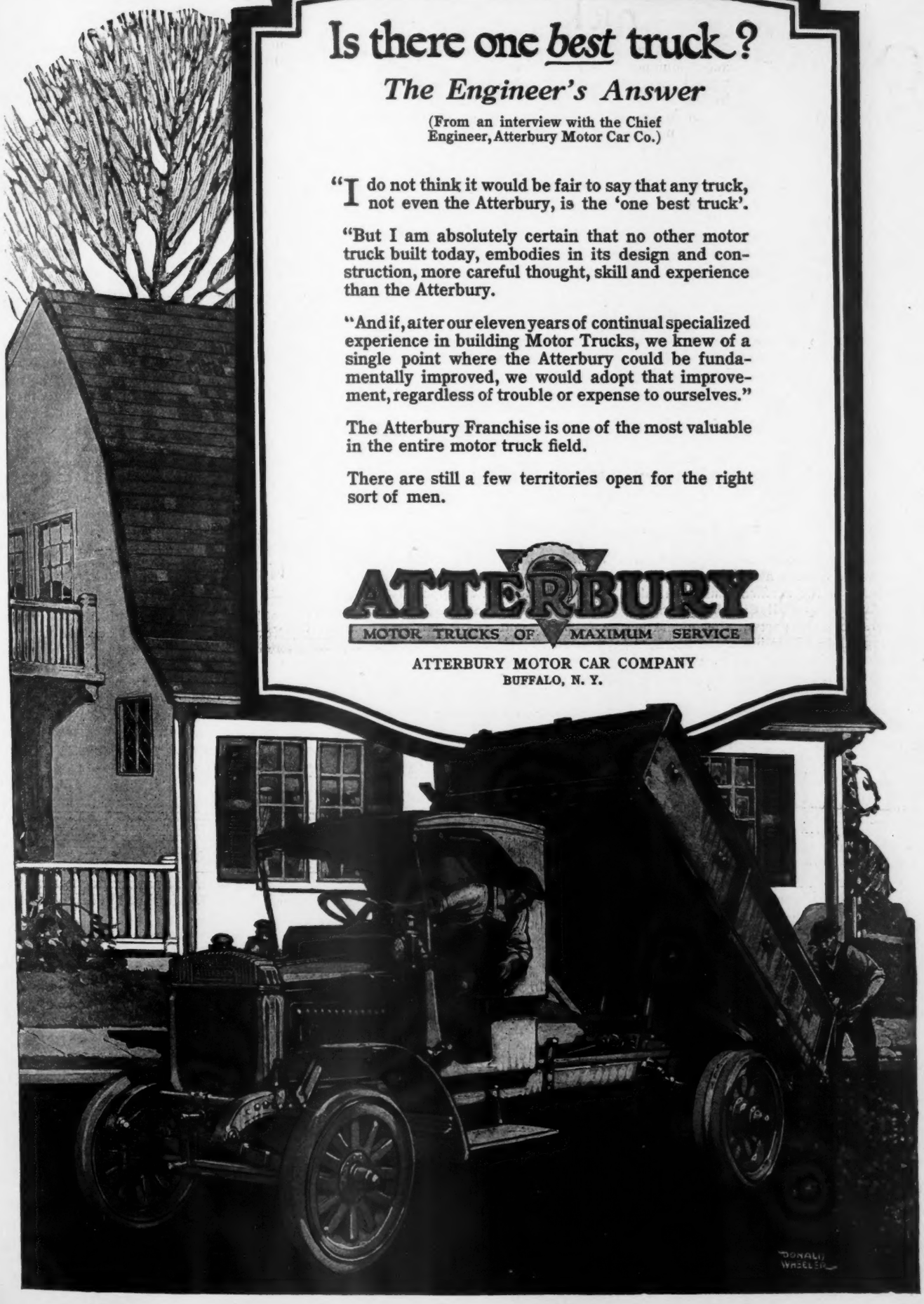
The Atterbury Franchise is one of the most valuable in the entire motor truck field.

There are still a few territories open for the right sort of men.

ATTERBURY

MOTOR TRUCKS OF MAXIMUM SERVICE

ATTERBURY MOTOR CAR COMPANY
BUFFALO, N. Y.



Recent Tests Show Road Wear and Resistance

Pneumatic Tires Materially Lessen Impact. Government Officials Studying Wearing Qualities of Pavements and Sub-Grade Materials

SUCH important questions as how hard a heavy motor truck pounds a pavement when going at five miles an hour and at fifteen miles an hour are being answered by investigators for the Bureau of Public Roads, United States Department of Agriculture, in a series of scientific experiments, which, when completed, promise to be of great value to highway engineers. Already sufficient tests have been made to show that increased speed of a vehicle equipped with hard rubber tires tremendously increases the impact which its wheels make on the roadway where there is any unevenness. On the other hand, where pneumatic tires are used increased speed adds comparatively little to the impact. It has been suggested that these tests will be of great value not only in settling questions of design, but may also lead to a rational basis for fixing license fees for motor vehicles.

Trucks have been used in these tests varying in size from a 1-ton truck up to a 7½-ton truck carrying an excess load. Each truck was run over a special recording device embedded in a roadway and the impact which resulted when one of the wheels made a 2-in. drop from a ledge built in the surface caused the deformation of specially prepared copper cylinders forming part of the apparatus. The magnitude of the blow was accurately ascertained in pounds by measuring the extent to which the cylinder had been forced out of shape.

Recent tests were made with a 3-ton truck of well-known make loaded with a 4½-ton load, so that the total weight on each rear wheel was 7,000 lb., the unsprung portion being 1700 lb. and the sprung portion (that portion supported by the springs), 5300 lb. The truck was equipped first with an old solid tire that had been worn down to a thickness of 1 in. Then, with exactly the same load on the truck, a wheel was used fitted with a new solid tire 2½ in. in thickness. And finally, the truck was equipped with pneumatic tires 42 by 9 in. and blown up to a pressure of 142 lb. per sq. in. The following table shows very clearly the bad effect an old tire is likely to have on a road surface and the greatly lessened impact produced by trucks when they are equipped with pneumatic tires. The tests show that as the vehicle's speed increased the impact from the old hard rubber tire increased greatly. The impact from the new hard rubber tire was somewhat less.

Approx. Speed	Height	Old Tire	New Tire	Pneumatic Tire
5.7	2 in.	11,600	9,400	7,100
10.2	2 in.	18,500	14,100	7,800
14.6	2 in.	26,500	18,700	8,300

Related to these tests is another series which utilizes the figure secured in the first experiments. A number of paving slabs were tested by means of a machine designed to give impacts equivalent to those produced by the rear wheel of the heavy truck already referred to. The unsprung portion of the weight of this machine is 1500 lb. and the sprung portion weighs 6000 lb. The tests were made by raising the entire weight through a height of ⅛ of an in., allowing it to fall 500 times, then to a height of ½ in. with 500 repetitions, then ⅜ in. more in height, and so on until the slab failed. To date about 12 slabs have been tested, laid on a rather wet sub-grade. A surprising difference has been found in the strength of the different types of pavements tested. The total number of blows required to cause failure have varied with the different slabs from 67 up to almost 2000. All this data promises to be of the greatest value to engineers in selecting material for roads of various types.

Relative Wear of Different Pavements

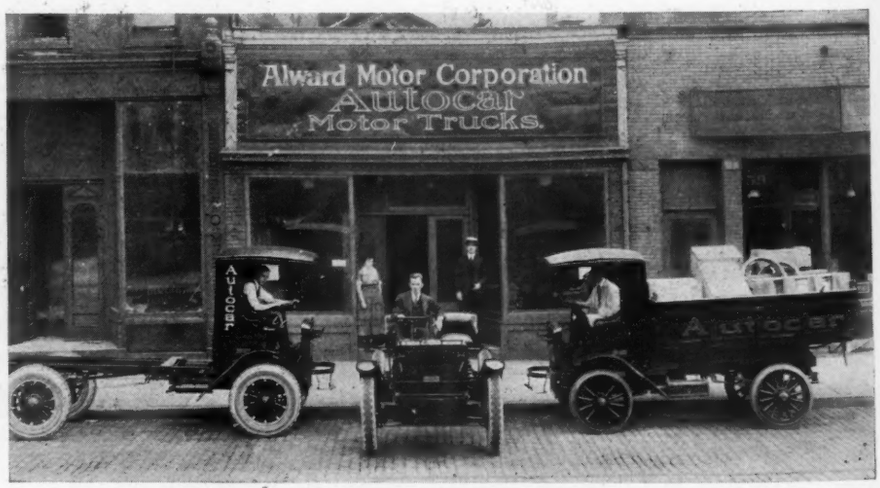
The Bureau of Public Roads is also making a study of the relative wearing qualities of different types of pavements and tests have been about completed on a short section of pavement containing 49 different types subjected to the wear of a special truck equipped with five large cast-iron disk-like wheels. The relative wearing qualities of hard as compared with soft brick are brought out very distinctly in this test. The resistance to wear of various kinds of stone block sections is also shown up to good advantage. A chance to compare grout and asphalt fillers for both brick and stone block is furnished by this investigation. Likewise, the relative wearing qualities of concrete when mixed with various kinds of coarse aggregates is indicated.

The investigation of sub-grade materials started a few months ago with the co-operation of the District engineers and State engineers is proceeding at a very satisfactory rate. A number of samples have been received from various parts of the country and laboratory analyses of many of these samples are partially completed. The methods being used by the Division of Tests will shortly be published as a paper so that any other laboratories wishing to conduct similar investigations may have some guide as to the method of procedure being followed by the Bureau of Public Roads.

The samples analyzed have been taken from parts of the roads that have failed very badly, as well as from adjacent parts of the same roads that have withstood heavy traffic successfully. It is hoped that by a comparison of the laboratory results on these samples with the reported behavior of the road in service differences in the sub-grade materials will become apparent so that we will be able to say what physical characteristics soils must possess to give them high bearing value.

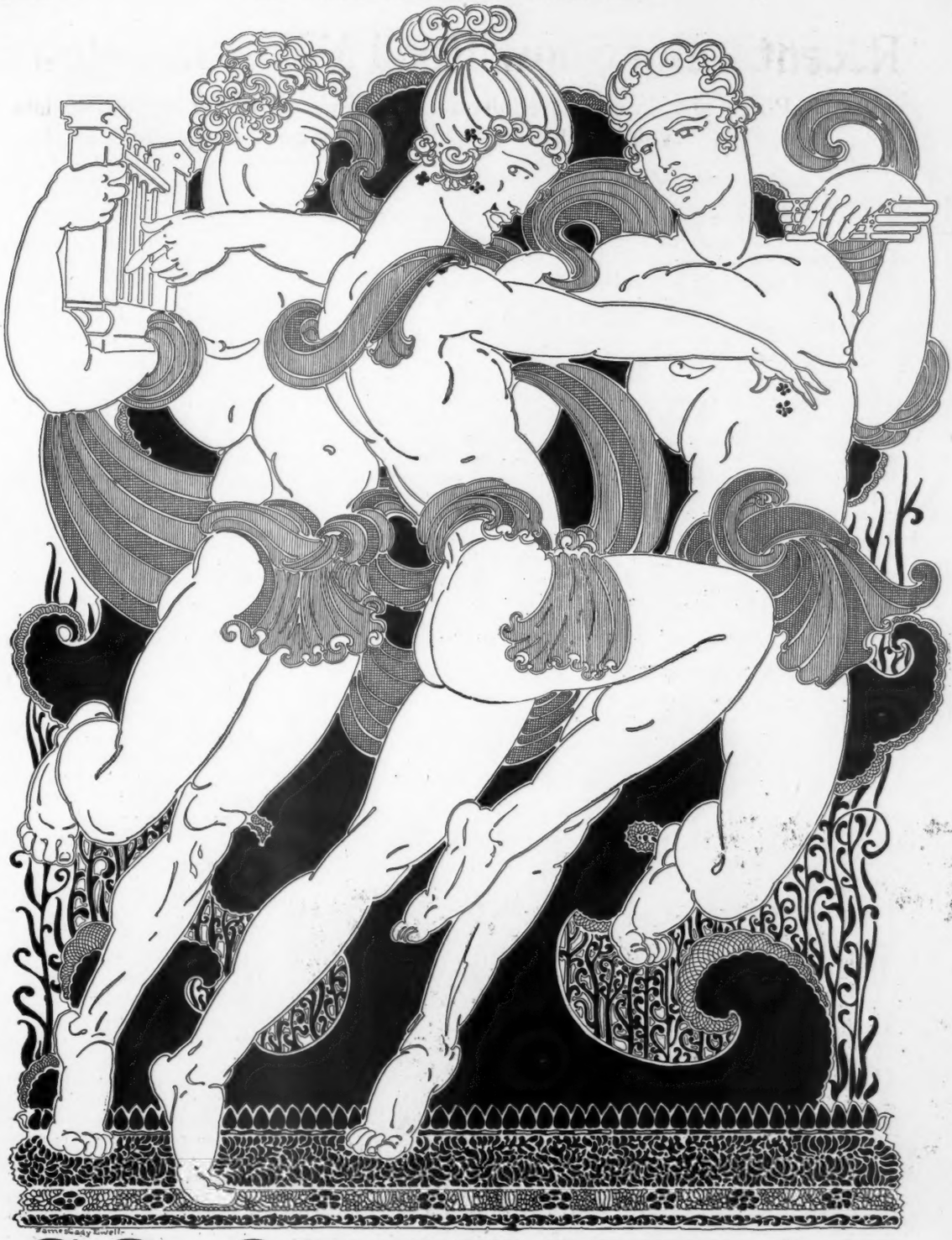
New York Buys Snow Removal Apparatus

The Commissioner of Street Cleaning, New York City, has placed an order for two hundred and twelve 5-ton and one hundred 2-ton trucks, fifty large and one hundred small tractors, three hundred push plows and a snow removal machine. This equipment will be utilized to remove snow from the streets. The truck chassis will be used in the summer for street sprinkling. A school for teaching driving and operation of the equipment has been established.



New Truck Sales Organization Established in Rochester, New York

C. F. Alward, for several years advertising manager of the H.-O. Co., Buffalo, N. Y., and his son, Francis Alward, formerly a salesman for E. T. Parkes, the veteran Buffalo dealer, recently formed the Alward Motor Corp. for the exclusive sale of Autocar motor trucks in Rochester. They have opened an excellent show room and service station at 261 Central Ave., Rochester. Expert mechanical assistants and a complete supply of parts bid fair to the rendering of complete and satisfactory service to all Autocars in their territory. In addition to the two principals in the business there are two salesmen who are covering Rochester and outside territory.



CO-ORDINATION

CLARK AXLES

For Motor Trucks

Co-ordination of mind and muscle is exemplified in the dance, where every muscle is made to harmonize with every note of the music—similarly Clark Axles are designed to function as a *harmonious* unit of a complete truck—as the mechanic says, they run "sweet."

CLARK EQUIPMENT COMPANY
Buchanan, Michigan
Also makers of Clark Steel Disc Wheels for Motor Trucks

How to Make Your Truck Last Longer*

IN New York, recently, a motor truck ran into a taxicab. Three people were killed or injured. Both the truck and the taxi were total wrecks. In court it developed that the truck driver could neither speak nor read English.

The owner of a five-ton truck had allowed this man to drive it through crowded streets—unable to read the traffic signs. How many times he had violated traffic laws will never be known, but one of his failures to read the officer's "STOP" signs was paid for in flesh and blood, and in two machines worth far more than his yearly wage.

Truck owners should draw a moral from that bit of current history. Never employ an unintelligent operator, or one who is not capable of obeying without hesitation any order from his superiors or from the law!

Just as surely as you put an inefficient man in charge of your truck, you will get unsatisfactory service. A motor truck, like any other piece of machinery, can be efficient only when efficiently handled.

The driver question looms big with many employers. Most of them are agreed that better results come from training sober, cool-headed, reliable men —possibly teamsters—than from employing mechanical experts of proved ability to take taxicabs around corners on two wheels and to weave through crowded traffic at a breakneck speed. The taste for speed is easier to acquire than to relinquish—and in a motor truck it is not only dangerous, but is an agent of destruction.

Lack of interest and loyalty is the commonest complaint against truck operators. They fail to keep the truck in good condition, because it makes no difference to them whether it runs or stands in the garage. And a truck that is unduly expensive to operate takes no more from their pockets than one that costs almost nothing in repairs or supplies.

This is a problem that must be faced and solved by each individual owner. Some have done it by a system of merits and demerits; reward and punishment for things done or left undone. Others have done it by offering prizes and bonuses to drivers whose cost records reflect intelligent care and attention to the truck itself. Still others have solved it by putting the driver on half-pay when the truck has to be sent to the shop because he failed to report symptoms that foretold accident, breakage or interrupted service. At the same time they make a provision that pay is not decreased if the truck goes to the shop on the recommendation of the driver, providing the trouble to be corrected is still in its initial stages.

One of the biggest users of motor trucks in an eastern city has solved it by turning the truck over to the driver after he has handled it satisfactorily for two years, then having him haul for the firm on a fair contract basis. Officials of the company say they have found that this plan saves them enough in the first two years of a truck's life to make it possible to give away the truck, and actually save money while doing it.

But whatever plan of remuneration you adopt, and whatever steps you take to insure the driver's interest in the firm, the first essential will be the selection of the driver himself. Don't make the mistake of thinking that any man who can handle a steering wheel is fit to be trusted with your investment. Not only may he ruin the truck, but you will be held accountable for any damage to other machines or to persons.

Many owners have decided that the dash and vigor of youth is not only unnecessary in a truck driver, but that it is often a serious menace. Likewise, a high-strung, nervous man is apt to take out his temperament on the car.

Defects in hearing or vision, of course, should be regarded as an absolute bar against employment.

Encourage your driver to study your transportation problems and to read truck literature. If the driver knows why it is poor policy to overload or to overspeed your truck, he is much more likely to use care and judgment than if merely told, "Don't carry more than so many pounds, and never go more than so many miles per hour." Select the men intelligently, and then treat them as human beings—and the chances are that the driver problem will not cause you any loss of sleep.

*This article, written by an observant representative of the Diamond T Motor Car Co., Chicago, Ill., contains worthy observations concerning that all-important and unappreciated problem — the driver.

Hauling Wool by Motor Truck

The Warren Live Stock Co., with its main ranch fourteen miles from Cheyenne, Wyoming, used to keep three four-horse teams going hauling the annual wool clip to the Union Pacific freight house at Cheyenne. Today a five-ton White truck and a five-ton Troy trailer do the work quicker, better and with a whole lot less expense. The truck, with 21 four hundred pound sacks of wool aboard, and the trailer with 19 sacks make four round trips to the city in a day of eight hours, using about fifteen gallons of fuel to the round trip. The driver carries a helper to assist in loading and unloading.

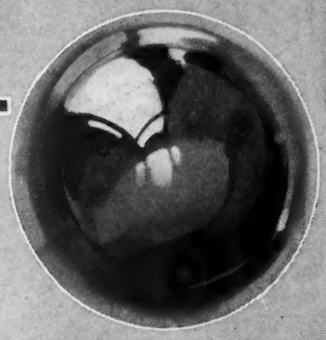
When there is no wool hauling to be done the truck and trailer haul grain, hay, coal and other ranch supplies, and the outfit has few idle days during the year. A 1½-ton White truck is used by the ranch in hauling supplies to the isolated and constantly moving sheep camps and it has been found a very cheap and efficient method of keeping the herders supplied.

Delivering Wool to the Union Pacific Freight House at Cheyenne, Wyoming

Four One and a Half Ton Rumely Trucks Make Debut on a Demonstration Run

On August 12th four of these trucks left Laporte, Ind., the home of their manufacturer, the Advance-Rumely Thresher Co., on a demonstration run, each with 3500 lb. of repair parts. Their route was as follows: Indianapolis; Peoria; Des Moines; Kansas City; Wichita; Dallas; Wichita; Aberdeen; Fargo and back. These trucks are made in the company's factory at Chicago, Illinois.

HOOVER STEEL BALLS



A ball making plant of unprecedented size—machinery, tools, and standards of unprecedented accuracy—production processes and facilities really unique—a keen conception of the properties of the truly flawless ball—

Here are four reasons why the demand for Hoover Steel Balls has always exceeded the supply.

HOOVER STEEL BALL CO.
ANN ARBOR, MICH.

(1)

View of the main Hoover plant at Ann Arbor, Mich., showing the extensive manufacturing facilities of the company. Production includes balls of all industrial metals—steel, brass, copper, aluminum, Monel Metal, stainless steel, etc.

Taken From Current House Organs

The Gospel of Work

Is America to become a nation of shirks and slackers? Shall we continue to "let George do it?" Or are we now ready to emerge from the mental slump which followed the Great War and jump aggressively into the world-wide battle of Commerce, forcing our way to our rightful leadership among the nations of the earth?

Our place is among the leaders of the earth in Commerce, Finance and Industry. But unless we come out of our trance that place will be forever lost to us. America today plays the part of the dissolute Nero, jazzing away the precious hours while the Rome of our opportunity is destroyed by the fires of indifference.

"George"—meaning both our friends and enemies among the nations—is doing it, all right. He is going full speed ahead. Instead of leading, we are trailing. And lack of production is wholly responsible.

Work pays the bills. Work earns promotion. Work—honest, hard work—will help bring down the high cost of everything. Nothing else will. What America needs is less conversation and more perspiration.

We idle. We talk. We play. Others work. They toil night and day to repair the ravages of war, and to build up production in all lines.

What is the answer to be? Will America work, or will she want? Is the high cost to decrease, or will idle plants and empty shelves force it still higher?

The man who works fewer hours or does less work hurts his own cause. He cuts down production. He is an industrial slacker. There is no more excuse today for his conduct than there was in war times for the man who evaded his war obligations. Not alone does he injure himself. He hurts his family—his friends—his country.

Our safety as a nation depends upon production—hard, driving effort to forge ahead. Before the war, and during it, we made wonderful progress through production. Then we stopped to rest. Our minds and bodies are now rested and refreshed. Once more we must work—work to LIVE. The prosperity of the future depends wholly upon our actions today.

Production means work—work—and still more work!—until each of us has reached the height of his efficiency and earning power. Not alone do we need production in the factory, but in the office, on the road, on the farm, in the home—in every phase of our lives.

Work, for the joy of the work itself—for the sake of successful accomplishment—for the betterment of all—to bring down the high cost of living through increased production and decreased overhead—for the future peace and comfort of our sons and daughters—for the salvation of America—work!

Talk will not right conditions. Act! Work more and talk less. And as production creeps higher, day by day, the difference in prices and conditions will become apparent. Production alone will make that difference. Work brings production. Preach the Gospel of Work.—*U. S. Floating Power Plant News,* United States Motor Truck Co, Cincinnati, Ohio.

Lubrication; the Best Friend You've Got

Even the finest steel, polished up to a mirror finish, if placed under a strong microscope, will show thousands of jagged points like the teeth of a saw. When two pieces are rubbed together, these teeth lock with each other. They are ripped out, twisted, and others are pulled into their places.

Something must be interposed between the surfaces to keep them from tearing each other to rack and ruin. And that something is **oil.**

Oil not only fills up the thousands of minute depressions, but it actually interposes a film between the two surfaces. The moving parts of an oiled machine do not rub against each other, but against sides of a thin film of oil which keeps the jagged teeth of steel from coming in contact with each other.

The molecules which compose oil are perfect globes. So, as a lubricant, oil not only has the advantage of being liquid and therefore flowing freely, but it practically places ball-bearings between all moving parts and reduces friction to the minimum.

If steel worked against bare steel in a truck, not only would each part be subject to rapid wear, but the friction would generate such heat that the attendant expansion would "freeze" each moving part tight in its bearing. The steel would be pitted, scarred and scored; so that when it cooled off sufficiently to contract to normal, and the lack of oil was remedied, there would be "play" and, in motor cylinders, loss of compression at every point.

No other phase of truck maintenance is more important than lubrication. Running one hour without sufficient oil may cause greater wear than running several years under favorable conditions. If you have a driver who occasionally neglects the renewing of oil and grease, or who fails to tighten up the grease cups at proper intervals, it will pay you to get rid of him, no matter how valuable he may be in other ways, unless you keep a man to do that part of his work.

A truck can be speeded up to thirty or forty miles an hour, hit a bump, and break an axle or a spring. The driver will possibly be fired and forty or fifty dollars be spent for repairs.

But run a truck without oil, and, while there will be no excitement and the driver may be retained, ten times more harm will have been done than in the accident.

Pistons will be scratched and cylinder walls scored so that they will never be gas-tight again. Bearings will be worn a hundredth of an inch, perhaps. Axles, spindles, universal joints, steering gear—all scratched and worn out of true. The transmission and differential—damaged so that they will never work again at the same degree of efficiency. The worm-gear drive that was polished down to the thousandth of an inch (where one-sixth the thickness of a hair from your head makes a notable difference in efficiency) and designed to run in a perpetual bath of oil—scarred and scored so that it may soon have to be replaced by a new one.

The first commandment, then, in any garage might well be founded on Lubrication.—*Diamond T Accelerator,* Diamond T Motor Car Co., Chicago, Ill.

Suppose Capital Should Go on a Strike?

Suppose some morning without any previous intimation or warning, capital should go on a strike.

Suppose the manufacturer employing a large number of men and women should yawn and stretch some night about closing down time, call in his superintendent and say, "Tell our employees when they quit work tonight that we're through. Tell them they need not come back, that this plant is going to close down for an indefinite period and probably for all time."

And then suppose his superintendent should say, "But you can't do that; just think what that would mean to our employees who are dependent upon their daily wage for their own support and that of their families."

And then suppose the boss should say, "Can't, eh? Well I'll just show you whether we can or not. Just keep in your mind the fact that last spring when we were crowded with orders, a committee called on me one afternoon about four o'clock and said that unless I boosted everybody's wage fifty per cent., good and poor alike, that not a darned one of 'em would show up on the following morning. Did I do it? Sure I did. They had me in a hole and they knew it. And now I'm sick and disgusted with the whole blamed business. It's first one thing and then another. We break our necks to get the business and then when we get the stuff made, we can't ship it, because transportation companies have not cars enough or engines sufficient to move it, and so what's the use? If I close up and quit, I guess I can rake together enough to buy me a little chicken farm and, darn it all, I tell you I'm through. I'm tired of continually fussing, sweating and planning. It isn't worth it; life's too short and so lock the doors tonight and throw the key in the river."

Suppose, we say, Capital should go on a strike.—*The Four Runner,* Kalamazoo Motors Corp., Kalamazoo, Mich.

The Resiliency is Built in the Wheel

The Demand for Sewell Cushion Wheels Has Multiplied 136%

This Sales Growth Proves How Truck Owners Are Turning to Sewell Permanent Resiliency

Sales of Sewell Cushion Wheels increased 136% the first six months of 1920 over the corresponding period in 1919.

Such sales increase proves how truck operators regard the Permanent Resiliency Built in Sewell Cushion Wheels.

In recent issues of this publication we have published unsolicited letters from prominent truck dealers who have explained how Sewell Permanent Resiliency had reduced their service overhead to an unusual low figure and increased the truck owner good will toward their trucks.

What Sewell Cushion Wheels Mean to the Truck Owner

Sewell Cushion Wheels when once installed promptly deliver to their owner the following:

1st —A smooth, easy-riding truck

2d —A constant protection to all parts of the truck against road shocks

3d —Increased speed with safety

4th—Increased tire mileage

5th—More constant and uninterrupted service

6th—Small repair bills (few and far between)

Total

A permanent, well-paying investment which will outlive the truck

Sewell Cushion Wheel Company
DETROIT

Sewell Cushion Wheels

Metal and Rubber Markets

Steel Makers Show More Interest in Railroad Needs

Railroad equipment is in the forefront promising prospective business in the steel industry. Although the railroads have not as yet launched an extensive purchasing movement, the large number of inquiries now in the hands of car builders is significant of the substantial buying expected by the manufacturers since the granting of loans by the Interstate Commerce Commission.

There are two reasons why railway buying has not developed on a large scale as yet. One is that some of the roads are in difficult circumstances as regarding finances. Another factor has been the policy of the carriers in extending the efficiency of equipment now in hand. The railroads are gradually showing more interest in the acquisition of new supplies and this is expected to lead to the heavy orders looked for in the past two or three months.

Steel Products Prices

Per ton—Pittsburgh—			
Bessemer billets	$60 00	a	....
Open hearth	58 00	a	60 00
Forging billets	75 00	a	80 00
Sheets bars	65 00	a	70 00

Sheets

The following prices are for 100-bundle lots and over f.o.b. mill:

Blue Annealed Sheets—			
Pittsburgh (base)	5 50	a	7 00
Philadelphia	6 25	a	7 25
Chicago	6 27	a	7 27
Galvanized Sheets of Black Sheet Gauge—			
Pittsburgh	8 50	a	....
Chicago	8 77	a	8 92
Tin—Mill Black Plate—			
Pittsburgh	7 00	a	9 00

Structural Material

Structural shapes, Pittsburgh	2 90	a	3 25
Structural shapes, Phila.	3 35	a	3 85
Structural shapes, N. Y.	3 37	a	3 87

Finished Iron and Steel

Steel hoops and bands	5 50	a	....
Tank plates, Pittsburgh	3 25	a	3 50
Tank plates, New York	3 52	a	3 77
Steel bars, New York	4 38	a	4 63
Steel bars, Pittsburgh	4 00	a	4 25
Rails — Standard Bessemer sections, mill	55 00	a	60 00
Stand., open hearth, mill	57 00	a	62 00
Light sections—25 & 45 lbs.	3 25	a	3 75

Iron and Steel at Pittsburgh

Bessemer iron	50 46	a	51 46
Bessemer steel, f.o.b. Pitt.	60 00	a	....
Skelp, grooved steel	3 25	a	4 00
Skelp, sheared steel	3 50	a	4 25
Ferromanganese (80%)	170 00	a	190 00
Steel, melting scrap	28 50	a	....
Steel bars	4 00	a	4 25
Wire rods	70 00	a	80 00
Iron bars	4 00	a	4 75
Plain wire	4 00	a	....
Plain wire, galvanized	4 25	a	4 70
Cut nails	6 25	a	6 75
Wire nails, Pittsburgh	4 50	a	....
Steel hoops	5 50	a	....

OTHER METAL PRODUCTS.—Following are the prices current for brass and bronze products:

Copper sheets, not rolled	29 50c	a	....
Copper bottoms	38 00	a	....
Seamless tubing, bronze	34 50	a	35 50
Seamless tubing, copper	32 00	a	....
Copper rods	26 75	a	27 50
Copper wire	22 50	a	23 00
Cut lead sheets	12 25	a	....
High brass wire	25 75	a	....
High brass sheets	25 25	a	....
High brass rods	23 75	a	....
Low brass sheets	27 25	a	....
Low brass wire	27 25	a	....
Low brass rods	28 00	a	....
Nickel silver, 18%	39 50	a	....
Brazed tubing, brass	38 00	a	....
Brazed tubing, bronze	42 75	a	....
Brazed tubing, copper	42 75	a	....
Seamless high brass tubing	30 50	a	....
Seamless low brass tubing	33 00	a	....
Sheet zinc	12 50	a	....

Miscellaneous Metals

ANTIMONY.—Business is good. Buying is fairly active and inquiries indicate further transactions. The price, however, remains unchanged at 7c to 7¼c a unit. London is steady at £52.

GRAPHITE.—Price shading by some dealers recently has had little effect in stimulating volume business and the market may be termed as dull. Prices remain as follows: Crude Mexican ore, $31 60 per ton, New York; Korean, 3c per pound; Madagascar, 6c per pound, and Ceylon, 4c to 15c per pound.

MANGANESE.—Buyers' ideas are far below sellers'. The Brazilian ore is not freely offered at this time on account of coal shortage and shipping difficulties in Brazil. The sellers ask 65c a unit c. i. f. North Atlantic ports. Indian ore, due to higher freight rates, is offered even at a higher figure.

TUNGSTEN.—Some business is reported, though not large, yet for domestic consumption, which is taken to be encouraging. The prices, however, remain low and unchanged at $5 00 to $5 25 per unit for high grade; Chinese, $5 and Bolivian, $6 to $7.

OLD METALS.—The demand for scrap aluminum is quiet with prices nominal. Copper is dull. Consumers are out of the market. Small lots are changing hands at ¼c to ½c below selling prices. Scrap lead is freely offered to smelters by small dealers at 7½c a pound, delivered, but large holders demand 7¾c. Block tin scrap and pewter dishes are scarce and active.

	Buying.	Selling.
Aluminum—		
Cast scrap	20 a20½	21½a22½
Sheet scrap	20 a20½	21½a22
Clippings	25 a20	27¼a28
Copper—		
Heavy machinery comp.	13¼a13¾	16 a16½
Heavy and wire	13½a14	14½a15
Light and bottoms	12¼a12¾	13½a13¾
Heavy, cut and crucible	14¼a14¾	16 a16½
Brass, heavy	7¾a 8¼	9 a 9¾
Brass, casting	9¼a 9½	11 a11½
Brass, light	7¼a 7¾	8¼a 8½
No. 1 clean brass turnings	7½a 7¾	8½a 9
No. 1 comp. turnings	10¾a11½	12¾a13½
Tea lead	4¾a 5	5¼a 5½
Lead, heavy	7 a 7¼	7½a 7¾
Zinc scrap	4½a 5	5½a 6
Solder joints	10½a11	11½a12
New zinc clippings	5 a 5¼	5 a 6½
Pewter dishes	30 a31	40 a42
Block tin, scrap	38 a39	41 a42

Rubber Continues Quiet

Quiet conditions continue to prevail in the market for crude rubber. Manufacturers of rubber goods have been disposed to hold aloof from the market, lately purchasing only small quantities.

Para—Up-river, fine	29	a	..
Up-river, coarse	19¼	a	..
Island, fine	24¼	a	..
Island, coarse	16	a	..
Caucho ball, upper	18½	a	..
Caucho ball, lower	13	a	.
Cameta	15½	a	..
Plantation—First latex, crepe	25	a	..
Brown crepe, thin, clean	22½	a	..
Rolled, brown crepe	20	a	..
Smoked, ribbed sheets	23½	a	..
Centrals—Corinto	19	a	..
Esmeralda	19	a	..
Guayule, wet	24	a	25
Balata, block, Ciudad	*72	a	..
Balata, block, Panama	*50	a	51
Balata, sheet	*1 00	a	..
Mexican—Scrap	*22	a	..

* Nominal.

SCRAP RUBBER.—With larger supplies in sight than the trade can absorb and with only a limited buying demand the market rules easy, with a downward tendency manifested in all lines.

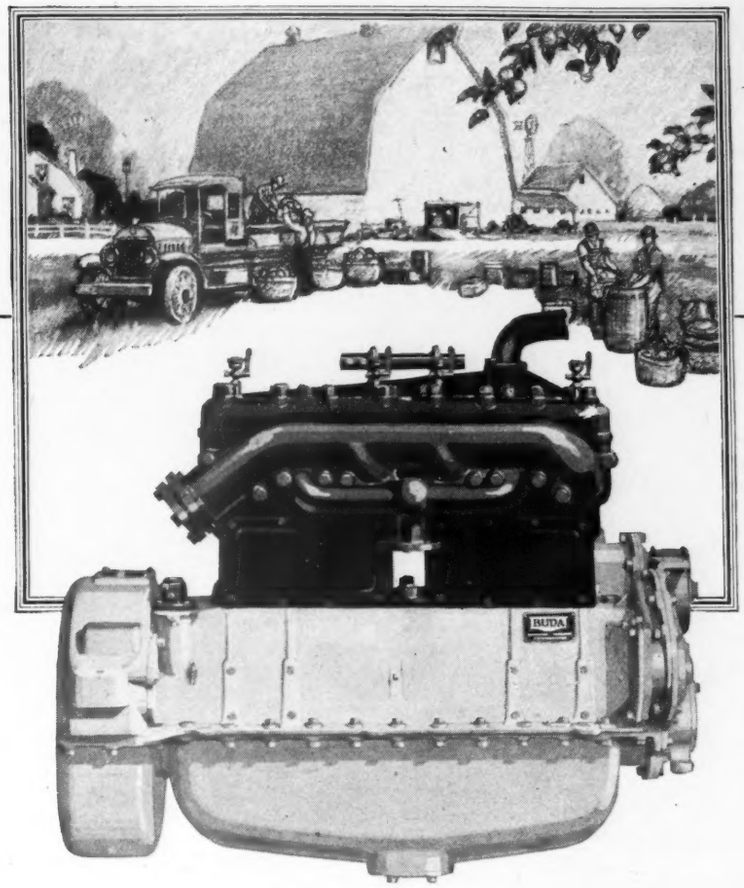
Boots and shoes	6	a	6½
Arctics, trimmed	5	a	5½
Arctics, untrimmed	4	a	4¼
Tires—Automobile	2¼	a	..
Bicycles, pneumatic	1¼	a	..
Hose, steam, fire	..	a	1¼
Inner tubes, No. 1	..	a	10
Inner tubes, No. 2	..	a	6

New Engine Invented

Consul General Wilbur has reported to the United States Department of Commerce from Genoa, Italy, the invention of a new engine, patented in America and Europe. It is claimed that British engineers seek control of the patent rights in all countries. The principal advantages claimed for the new engine, which is designed by Severe Campofregoso, an Italian engineer, are complete absence of valves and cam axis, four times the power of engines now in use; absence of vibration; no internal strains; reduction of attrition; economy in fuel; simplicity and rapid, low cost of construction.

Division Sales Managers of the Service Motor Truck Co., Wabash, Indiana, Who Met in Convention at the Service Plant on September 17 and 18

These sales managers representing every division of the United States, report that truck sales are now being made in greater volume than at any time during the past two months. The main point under discussion was as to means to help dealers in their resale work. The factory does not consider that it has made a sale when the truck is sold to the dealer, inasmuch as the sale is not completed until the truck is delivered to the ultimate consumer. To this end a greatly increased advertising schedule has been laid out, together with plans for dealer follow-up work.



TRUCKS that are equipped with the Buda engine are sold entirely on their ability to perform an economic duty, and to perform that duty dependably.

They are marketed as carriers of goods, and as such are valued for their demonstrated power, efficiency and long life.

The factor of engine performance in the operation of these trucks is guaranteed by the quality of Buda design, materials and workmanship.

The standards that thus assure the value of Buda-equipped products as profitable investments in transportation facility are the result of 39 years of engineering and manufacturing experience.

THE BUDA COMPANY, HARVEY CHICAGO SUBURB ILL.
ESTABLISHED 1881

BUDA
The
ENGINE

The Lima Sheet Metal Products Co., of Lima, O., will increase its capitalization from $50,000 to $300,000, according to recent announcements. A site for a new plant has been purchased and work on the new 23,000 sq. ft. factory will be rushed to completion.

The American Hammered Piston Ring Co., Baltimore, Md., through its export department has received an order from Honolulu, Hawaii, for 15,000 piston rings. The company's factory expansion during the past year now permits an output of 50,000 rings per day.

The New Era Spring & Specialty Co., Grand Rapids, Mich., have made a carload shipment that will be distributed at ten foreign ports. "Better" Spring Bumpers comprised the orders. Plans for doubling factory output will be made as soon as possible.

Hobart Brothers Company, Troy, N. Y., has established a program of greatly increased production, adding a line of general purpose, ball-bearing, electric motors of 1, 2, 3, 5, 7½ and 10 hp.

The Groetken Pump Co., Aurora, Ill., has been obliged to provide a new plant of about 10,000 sq. ft. for its increased business. The firm makes automatic measuring pumps for gasoline, kerosene, oils, etc.

The Reo Motor Car Co., Lansing, Mich., for August produced and sold more cars and trucks than in any month since the war, while dealers' orders for cars and trucks for September delivery are far in excess of the factory's possible output. Reo branches employ 500 persons and the factory 5200.

The Pennsylvania Rubber Co., Jeannette, Pa., has declared a regular quarterly dividend of 1¾ per cent on preferred and 1½ per cent on common stock, to stockholders of record of September 15.

The Buckeye Rubber Products Co., Cleveland, Ohio, with factory at Willoughby, Ohio, has bought the Polack Tyre & Rubber Co., organized in 1912 by Hugo Hoffstaedter. The new owners will continue the operation of the Polack factory until a duplicate can be built at Willoughby.

The General Motors Corp. steering gear plant at Saginaw, Mich., has closed down for a month, affecting about 750 men. Overproduction is the cause.

The Acklin Stamping Co., Toledo, Ohio, will increase capital from $50,000 to $100,000 and build a fireproof factory employing 750 men.

The Wills Corporation, Elizabeth Works, Elizabeth, N. J., is pushing the plant construction rapidly. The main assembly structure, of four stories, is 1440 feet long, and is now ready for machinery installation. When all units are completed a total of more than two million sq. ft. of factory floor space will be available.

Malley Electric Company the recent purchaser of the St. Louis Electrical Works, is moving into the new buildings on South Kingshighway. Offices and automotive departments are in the new location, but all motor manufacturing is still being done at the old plant, 4060 Forest Park Boulevard.

The National Carbon Company, Cleveland, Ohio, during October will conduct its second farm power campaign for the Columbia Hot Shot.

Electric Storage Battery Co., Philadelphia, Pa., has net earnings from sales for five months ending May 31, 1920, of $2,094,081. The company has a profit and loss surplus of $15,241,425.

The Kentucky Wagon Mfg. Co., Louisville, Ky., has acquired eighteen acres of land, and buildings and extensions costing almost $1,000,000, affording employment for more than 1000 men, will be undertaken within the next two years, or as soon as building material costs decline. The new plant will be used exclusively for the manufacture of automobiles, motor trucks and accessories.

Factory News and Capital Increases

The E L M Tire & Rubber Co., Racine, Wis., recently incorporated with $200,000, has secured a long term lease of a vacant factory and is buying equipment for manufacturing pneumatic and solid tires and expects production to be under way in September.

Lion Tire & Rubber Co., has acquired a ten-acre site at New Toronto, Ontario, for its new factory. Capitalization is $2,500,000.

The Owen Magnetic Car Corp., a Delaware corporation, with plant at Wilkes-Barre, Pa., has had receivers appointed. The company's plant and equipment is valued at $347,143. Difficulties are attributed to general financial and transportation conditions. The plant is closed at present, but continued operation is hoped for.

The Lorain Motor Truck Co., Lorain, Ohio, is now in production with its 2-ton J. & J. truck. The present factory has 10,000 sq. ft., and two trucks a day are being produced at present. The truck sells at $3,250.

Red Diamond Motors, Inc., will build its $1,000,000 assembling plant in Athens, Ga., instead of Atlanta, Ga., as was originally contemplated. Five Athens men are among the directors, hence the change. Next year a plant will be built for production of Red Diamond engines, the invention of W. H. Seabrooke and R. E. Hicks, president and vice-president of the corporation.

Tower Motor Truck Co., Greenville, Mich., will increase capital stock from $500,000 to $2,500,000. An additional 9000 sq. ft. floor space is being built, and 1400 trucks in 1921 is the predicted production.

The Ford Motor Car Co., Detroit, Mich., has purchased the holdings and leasehold of the Nuttall Smokeless Coal Co., in the new river district of West Virginia, a tract comprising 4000 acres.

The Western Vulcanizer Co., Chicago, Ill., has added 35,000 sq. ft., of floor space, making the area 45,000 sq. ft. New machinery has been installed. The firm reports that it's export business has tripled in the last five years.

Westinghouse Union Battery Company, Swissvale, Pa., is now producing batteries.

The F. B. Electric & Mfg. Co., Detroit, Mich., announce that the F. B. battery cover, and all other F. B. products, are now, and will be in the future, sold by the company, who can make immediate delivery.

The Michelin Tire Co., Milltown, N. J., has let the contract for a new storehouse, 60 x 125, affording 240,000 cu. ft. The company's new machine shop and turbine house are now being built.

The Denman-Myers Cord Tire Co., Warren, Ohio, has started increased production of Denman cord tires, the new plant being completed, and machinery installed. Sales connections are being established throughout the country.

The Nash Motors Company's new $2,000,000 plant at Milwaukee, Wis., has completed the first Nash Four car in regular production, and elaborate ceremonies marked the event. The plant will employ 2000 men and produce 10,000 four-cylinder Nash cars.

The Chevrolet Motor Co. has established a zone sales headquarters in Baltimore, Md., for territory that includes Virginia, Delaware, Maryland and parts of West Virginia and Tennessee. H. G. Semmons is manager, coming from the Flint, Mich., factory.

The Locomobile Company has declared a regular quarterly dividend of 1¾ per cent on the preferred stock.

General Motors Co. plans two new plants in Grand Rapids, Mich., one to make Frigidaire refrigerators, and one for manufacturing Sunny Home electric power plants.

Jackson Motors, Inc., Jackson, Mich., held a dinner of officers and department heads recently, and expansion plans were outlined. Patrick Emersan, general sales manager, sketched the new line of cars for 1921. The factory will soon be operating to full production, with an augmented force, it was announced.

Hare's Motors, Inc., of New York, announces the following addition to the board of directors of the Locomobile Co.: Capt. Marion McMillin, A. P. Lathrop, Charles Willard Young, R. L. Kinne and Herbert Dillon.

The Harvey Springs & Forging Co., Racine, Wis., manufacturer of Harvey boltless auto springs, has opened up a factory branch at 3020 South Michigan Blvd., Chicago. Edward Murphy has been placed in charge of this new expansion caused by the increasing demand for the company's products.

The Akron-Newton F. & M. Co., manufacturers of the Garl signal automobile light, has purchased the Frank B. Hall Manufacturing Co. plant at Newton Falls, Ohio. The new organization contemplates an output of 50,000 lights per year.

The Pennsylvania Tubeless Tire Co. has recently been incorporated in Alliance, O., with a capital of $250,000. The firm will make a patent air coiled tire.

The New York Bearings Co., 311 W. 59th St., New York, has purchased the large plant of the R. & L. Bearing Co., in Long Island City. The firm has increased its capitalization and will greatly expand its bearing manufacturing and its regrinding business.

The American Hammered Piston Ring Co., of Baltimore, Md., has opened up an export branch to handle the demand for its piston rings abroad, offices to be at 47 Broadway, New York City. J. E. Sitterly has been appointed foreign sales manager.

The Hartford Automotive Parts Co. will erect a large drop forge plant at Kalamazoo, Mich. The company has just recently acquired the property and business of the Acme Universal Joint Co.

The A. J. Alsdorf Corporation, export distributor for accessory manufacturers, has been appointed agent for export distribution of Norlund Safety jacks, manufactured by the Norlund Novelty Co., of Williamsport, Pa. Australia and South Africa representatives of the corporation report the outlook for the exporting of automobile accessories extremely promising, owing to the increase in favor of the American car.

The J. & B. Mfg. Co., Pittsfield, Mass., makers of Ford timers, gave its fourth annual clambake and outing recently with an attendance of over 375, including guests from New York, Philadelphia and Boston. Field sports, dancing and lake trips, besides a sumptuous dinner, were enjoyed.

Continental Motors Corp., Detroit, Mich., with a large plant there, has an even greater plant at Muskegon, where four-cylinder engines for trucks constitute the entire output. Here a power plant is being erected that will make the plant independent of local water supply.

The Mason Tire & Rubber Co., Kent, Ohio, held its annual "get-together" of branch managers and salesmen on September 9 and 10, with several hundred present. A banquet, factory inspection, including following-through construction, for the first time, of the new Mason Junior cord tire, and conferences comprised the meetings.

Bethlehem Motors Corporation, Allentown, Pa., entered upon full production schedule in September. The big new plant is now completed. Shipments of motors from the plant of the company at Pottstown, Pa., are being received to enable a capacity production. This will approximate above 400 trucks per month of the four models which have been developed by the company.

IN the bearings sponsored by **SKF** its type of anti-friction bearings have been developed to their highest perfection. And **SKF** further provides an engineering service not only to assure to itself proper application and use of **SKF** marked products but to help the buyer to fully capitalize the mechanical value built into each device. This service is freely offered and is being continually broadened and advanced by laboratory research that is international in scope. You are assured a similar service behind every product bearing the mark—

SKF

Among these products now offered are:

Single row deep groove ball bearings.
Double row self aligning ball bearings.
Steel balls.
Transmission equipment.

SKF Industries, Inc.
165 Broadway, New York City

Supervising at the request of the stockholders
The Hess-Bright Manufacturing Co.
SKF Ball Bearing Co.
Atlas Ball Co.
Hubbard Machine Co.
SKF Research Laboratories

***SKF** Research Laboratory established at Philadelphia to co-operate with the big Gothenburg Laboratories in the study of the American Manufacturers' friction problems.*

617

A. E. Barker, formerly supervisor of districts for Dodge Brothers, Detroit, Mich., has become general sales manager of the Maxwell and Chalmers companies.

J. H. Barnett, for more than two years advertising manager of the Martin-Parry Company, has assumed charge of all the advertising of the Robert H. Hassler, Inc., Indianapolis, Ind. He has been associated with the Firestone and Prest-O-Lite organizations, where he devoted himself exclusively to dealer development work.

E. H. Brandt, formerly Western sales manager of the Ajax Tire & Rubber Co., has been appointed district manager of the Chicago division of the Oldfield Tire Company, of Cleveland.

P. B. Brown, formerly of the Liberty Motor Car Co., of Detroit, has been appointed general sales and advertising manager of the Thomart Motor Co. of Kent, Ohio.

George T. Bryant has been made export manager for Robert H. Hassler, Inc., Indianapolis, manufacturer of shock absorbers. He will go to England, France and Belgium, with Hassler headquarters during the trip at Piccadilly Hotel, London, and Grand Hotel, Paris.

L. W. Cash, purchasing agent for the Defiance Motor Truck Company, Defiance, O., severed his connection with that firm October 1. His future plans are not known.

Norman Cole, formerly general manager of the Akron (O.) Advertising Agency, is now with the Messengale Advertising Agency, Atlanta, Ga. He will have complete charge of all automobile and automobile equipment campaigns as well as the merchandising and service departments.

A. Randall Crapo, formerly advertising manager for Gray & Davis, Inc., is now connected with the Department of Publicity, Westinghouse Electric & Manufacturing Co., with offices at 82 Worthington St., Springfield, Mass. He will have charge of the publicity of the Automotive Equipment Division.

Roy Davey, who resigned several months ago as general sales manager of the Bethlehem Motors Corporation, has returned to his former duties at the Bethlehem plant at Allentown.

Paul D. Davis has been made advertising manager of the Packard Motors Export Corp., New York. He has been holding a similar position with the Firestone Tire & Rubber Co. for two years.

C. S. Gill, who was formerly Southern division manager and later wholesale manager of the Chicago branch of the Vim Motor Truck Company, of Philadelphia, has been appointed division manager for Ohio and Western Pennsylvania.

G. M. Graves has been appointed assistant sales manager of the Stewart Motor Corporation, and designer of the new Briscoe, has the Pierce-Arrow.

C. Floyd Greene, formerly sales manager for the Grant, Lees Co., has resigned to become sales manager for the Ohio Motor Vehicle Co., Cleveland, manufacturers of the Ferris car.

Jules Haltenberger, for the past five years chief engineer of the Briscoe Motor Corporation, and designer of the new Briscoe, has resigned. He has not disclosed his future plans.

H. R. Henry, for the past four years wholesale sales manager for the Overland Automobile Co. of St. Louis, has joined the sales force of the Traffic Motor Truck Corp.

W. E. Hobbie, former assistant manager of the Oakland branch, Omaha, Neb., has been made manager of the Oakland branch house, Des Moines, Iowa.

Julius Janes, formerly president Standard Steel Castings Co., Cleveland, Ohio, has become sales representative of the Farrell-Cheek Steel Foundry Co., Sandusky, Ohio, in Cleveland and Cuyahoga counties, Ohio.

Personal Items

C. L. Kelsey has been appointed Cincinnati district sales manager of the B. F. Goodrich Rubber Co., in charge of Louisville, Dayton, Huntington and Cincinnati branches.

Charles A. Kingsley has been appointed manager of the Locomobile San Francisco, Calif., branch of Hare's Motors.

A. A. Loeffler has recently been appointed by the Doehler Die-Casting Co., as its Detroit representative, succeeding F. C. Seeger, who will now represent the company on the Pacific Coast, with offices at San Francisco.

A. N. Lyon has been appointed division manager for the Vim Motor Truck Company, of Philadelphia, to handle the States of Kentucky and Tennessee.

A. M. Merrifield, factory representative of the American Hammered Piston Ring Co., for Colorado, Utah and Wyoming, has been transferred to special sales work in the central and eastern states. He has had a remarkably successful sales record in the Rocky Mountain district.

W. H. Miles, English engineer and inventor, is in this country conferring with the C. A. Shaler Co., Waupun, Wis., concerning plans for distributing Shaler vulcanizers and roadlighters in Europe, from the European factory of the Shaler company.

Fred H. Miller has been appointed general sales manager of Hare's Motors of New England. He was formerly president of the Packard Motor Car Co., of New York.

F. L. Mowder has bee nmade comptroller of the Handley-Knight Co., Kalamazoo, Mich. He was comptroller of the Toledo Scale Co.

Ralph Mulford has been engaged by the Paige-Detroit Motor Car Co., and will devote his entire time and energy to the interests of the Paige. He will exploit the Paige's speed, power, endurance in contests, exhibitions, etc.

W. J. McIntyre has resigned from the Splitdorf Electrical Co. sales force to represent the Van Sicklen Speedometer Co. in the eastern territory.

C. W. McKinley has been appointed sales enginer of the Tillotson Manufacturing Co., carburetors, Toledo, Ohio, going there after eleven years as chief designing engineer with the Willys-Overland Company.

Carl H. Page, head of Carl H. Page Co., New York, distributor of Chalmers and Jordan cars, has been made director of sales, service and advertising for the Saxon Motor Car Co. M. A. Hollinshead is advertising manager.

Guy H. Peasley, distribution manager of the Olds Motor Works, Lansing, Mich., has been promoted to the position of assistant sales manager, in place of C. F. Batchelder, resigned.

Fred D. Rice has joined the forces of the Eaton Axle Co., Cleveland, Ohio. He was formerly with the Hess Steel Corporation.

Fred P. Scribner, superintendent for many years of the Raybestos plant, Bridgeport, Conn., and superintendent for past eleven years of the F. L. Horton Mfg. Co., Boston, Mass., has acquired an interest in the Staybestos Company, Philadelphia, and is now its plant superintendent.

C. F. Seward has been appointed sales manager of the Brooklyn branch of the Sterling Motor Truck Company of New York.

John Tainsh has been placed in charge of sales for the Mitchell Motor Car Co., Racine, Wis., succeeding R. C. Rueschaw.

G. C. Unger has been added to the sales force of the Perkins-LeNoir Company, 963 Drexel Building, Philadelphia, Pa., representative of the Roller-Smith Company, New York.

M. Van Riper has been appointed western sales manager of the Ajax Rubber Co., Inc., with headquarters in Chicago.

H. J. Vogler has resigned, in order to take a much needed rest, from the general sales managership of the American Motor Truck Co., Newark, Ohio. After fifteen months of work as sales manager, Mr. Vogler has secured 75 distributors in practically every State in the Union, and most of the European and Asiatic countries. He has been with the industry eleven years, having been western manager for the Maxwell Motor Co., Inc., and wholesale manager for Willys-Overland, with headquarters in New York. His future plans are not known, and he is living at the Union League, Broad and Sansom Sts., Philadelphia, Pa.

A. B. Way, until recently secretary and general manager of the Bridgeport Chain Co., has become district sales manager for New England of the Chain Products Company, Cleveland, Ohio, with headquarters at the company's New York office, 150 Chambers St.

R. L. Wilkinson, who has been sales manager of the wholesale division of the Klaxon Co. for the past year is now in charge of the industrial division, the industrial and wholesale divisions having been recently consolidated. V. E. Vaughn has been appointed his assistant. Mr. Vaughn will, however, also continue as assistant sales manager of the wholesale division.

Warren M. Zerby has been appointed traffic manager of the Briscoe Motor Corp.

Personal—Retail Trade

The American Automobile Accessories Stores Corp. plans, it is said, to extend its chain of stores by the purchase of an established shop in Wilkes-Barre, and the opening of two stores in two other Pennsylvania cities.

Fred Amsbary returns to Detroit, Mich., as sales representative of the Potts Motor Sales Co., Standard truck distributors.

Paul Bennett, formerly wholesale district manager of the Cadillac Company, Detroit, Mich., has joined the sales force of the Gulf Oldsmobile Co., New Orleans, La.

Dashiell Motor Co., Wabash Ave. at Twenty-sixth St., Chicago, Ill., representative for the Dodge car, is in its new three-story service station, 120 x 193, with 70,000 sq. ft. The firm has twenty-seven other service stations in selected locations in Chicago suburbs and vicinity.

H. E. Heber, formerly sales manager for Harry E. Herndon, Inc., Los Angeles, Cal., has purchased an interest in the FWD Truck Company, of Los Angeles, distributors of FWD trucks in Southern California. It is said that he will take an active part in the work of building up a dealers' organization.

W. H. Storms has incorporated the Storms Automobile Supply Co., Kansas City, Mo., for $100,000, wholesale and retail, with salesmen on the road.

Truck Aids Iron Output

The motor truck has been a big factor in upholding Birmingham as the center of the iron industry of England. Large quantities of finished iron are conveyed by road into the city so quickly that the iron has scarcely cooled before it is delivered at the merchant's warehouse or the mill of the tube maker or the factory of the bedstead manufacturer. This assists speedy production in Birmingham and secures a safe and reliable market for the production of the numerous iron mills of South Staffordshire.

GARFORD

Clear the Terminals!

The use of motor trucks at railway terminals will free thousands of freight cars for active use in the present traffic tie-up. Terminal congestion is the chief cause of our clogged transportation system. Without distribution business stagnates. Motor trucks can and will relieve this condition. America's leading statesmen, financiers and railway officials urge wider use of the motor truck.

Keep the Traffic Moving

TRUCKS

New Incorporations

The W. E. Seymour Manufacturing Corp., of Milwaukee, Wis., recently incorporated at $200,000, announces that although it is chartered to manufacture a variety of motor parts, it will confine itself to piston rings for the time being.

The Trackless Transportation Corporation, 30 Church St., New York, has been organized with George R. Bidwell, president, Herbert Y. McMullen, vice-president, and Ezra C. Bull, secretary and treasurer. The company will market a specially designed motor bus, which is in no sense, it is announced, a motor truck chassis converted to carry a bus body. The company states it will shortly announce specifications.

Southern Motor Finance Corp. has been formed by prominent business men of Georgia, with an authorized capital of $12,000,000, with headquarters in Atlanta's automobile row. The company will handle automobile paper and finance dealers, charging the standard rates.

Blackburn Automotive Co., 515 Louisiana St., Houston, Texas, has been organized with a capital of $100,000 for the purpose of salvaging old Ford cars, renewing and reclaiming such parts as are still useful, and assembling what will be to all intents and purposes a new car, that looks and runs like a new Ford. The company is in the market for all kinds and character of Ford parts, genuine or replacement, or outlaw, and expects to be in full operation about January next.

The Hood Motor Truck Co., Monroe, Mich., is being organized by W. C. Hood, who has been identified with the industry since its beginning and has been general sales manager of the Chalmers Co., of the Metzger Motor Car Co., and the Standard Motor Truck Co., Detroit, resigning from the latter company to form his own company. The Hood experimental models have been undergoing tests for several weeks.

The Wall Pump and Compressor Company, Quincy, Ill., has been formed by George A. Wall, formerly with the Gardner Governor Co.

Koehler-Rahn Auto Co., Milwaukee, Wis., has been incorporated for $100,000, as distributor and dealer in motor vehicles, tractors, etc.

The C. G. Spring Co., Kalamazoo, Mich., a new million-dollar Delaware incorporation, is headed by Christian Girl, former head of the Standard Parts Co., and now conducts the business of the Kalamazoo Spring & Axle Co., which is the manufacturing and selling of springs for motor and horse-drawn vehicles. Mr. Girl purchased and took over the axle company last May.

Association News

The Automotive Equipment Assn. has lost George Fritz, resigned, to take effect December 1. For four years he has done valuable executive work as assistant to Commissioner Webster.

The Automotive Service Association, of Syracuse, N. Y., has been formed along the same lines as the one in New York City. H. H. Smith is secretary at 207 University Building.

The California Auto Trade Assn. is raising money to take care of its interests at the coming meeting of the State legislature. Several thousand dollars will be needed.

The Florida Automotive Dealers' Association announces the appointment of W. A. Riddle, of Miami, Florida, filling the vacancy caused by the resignation of S. J. Thorp.

The M. & M. A. has enlarged its traffic department and H. Deuster is its new manager. The need for traffic service in view of increased rates and general importance of railroad matters to the industry seemed to warrant the extension of the association's work. Mr. Deuster brings to his new work eighteen years of railroad experience.

The St. Louis Automotive Assn., about January 1, will contain the present Dealers' Accessory, Tire & Battery Associations, a plan that has been under way for some time.

New Agencies

Anthony Kayser Sales Company, 238-40 S. 11th St., Philadelphia, has been appointed distributor for Transport Motor trucks in Eastern Pennsylvania, New Jersey and Delaware.

Dwight P. Robinson & Co., Inc., with which Westinghouse, Church, Kerr & Co., Inc., has recently consolidated, engineers and constructors, New York, has established a new branch office in Youngstown, O., in the Home Savings and Loan Building, in charge of C. I. Crippin. Other branch offices are in Pittsburgh, Pa., Cleveland, Ohio, Chicago, Ill., Dallas, Texas, and San Paulo, Brazil.

L. F. Hobbs, Norfolk, Va., will open a branch at Charlotte, N. C., as distributor of Sterling trucks in the Carolinas. R. W. Dodgen, of Spartanburg, will be in charge.

Robel & Bryant, Inc., Advertising Agency, Chicago, Ill., has opened an office in Avenue Building, Cleveland, Ohio, under the direction of Frank B. Rae, Jr.

The National Chain Motor Service Corp., with offices at 739 Boylston St., Boston, Mass., organized to establish a national chain of repair shops, has opened the first link, 128 Cambridge St., Charlestown, Mass.

The Fidelity Motors, Inc., 4830-34 Market St., Philadelphia, is the new distributor of Armleder motor trucks, made by the O. Armleder Co., Cincinnati, O. The agency, under the management of Everett Cummins, has a floor space of 12,000 sq. ft.

The India Tire & Rubber Co. announces two new distributing companies for its tires. The Allen & Guard Tire Co., of Denver, will handle the whole state of Colorado, while the General Auto Supply Co., of Richmond, will look after the Richmond territory.

Charles S. Smith, Inc., Philadelphia, Pa., is now the agency in Philadelphia and adjacent territory for distributing Amazon tires and tubes.

The Price Rawn Motor Company has been formed by P. M. Price, former manager of the wholesale department of the B. L. P. Motor Company, and the new firm will act as factory distributors in the District of Columbia, Virginia and West Virginia for the General Utility Company, 1326 Ogden St.. Philadelphia, Pa. General air compressors and General lighting cut piston rings will be the line carried.

The Port Houston Motor Co., Houston, Texas, has the entire Reo line for Southern Texas; temporarily at 602 Capitol Ave.

The Kaylor & Wolf Auto Sales Co., Decatur, Ill., has been appointed distributor for the Premier and the Jackson for central Illionis. The firm recently bought the garage and sales agency of Meyers & Balden, 506-10 Prairie Ave., where it is now installed.

St. Louis Manufacturers' & Dealers' Asso., Motor Accessory Trade and the Tire & Battery Dealers' Association are now established in their permanent offices at 3124 Locust St., St. Louis, Mo.

The Logan (Ill.) Automobile Dealers' Association has elected the following officers: R. E. Stallings, president, who succeeds F. C. Orton, resigned; J. L. Pettitt, vice-president; C. H. Knapp, secretary, and Ray Walker, treasurer. To celebrate the first anniversary of the founding of the association a banquet was given October 4.

Removals and Trade Changes

John L. Clough Advertising Agency has moved to the fifth floor of the Bobbs-Merrill Building, 18 University Square, Indianapolis, Ind.

American Malleables Co. have moved their general sales offices from their plant, Lancaster, N. Y., to the Kresge Building, Detroit, Mich. Vice-President P. G. Smith is in charge.

The Wilkening Mfg. Co., Philadelphia, Pa., is the name of the merged interests of the the Motor Parts Co. and the former company.

The Lockwood Mfg. Co., maker of Lockwood line of auto fabric accessories, has moved its eastern branch office and plant from Brooklyn to Buffalo, N. Y. Paul Lockwood is managing director of the company. Harry B. Lockwood is vice-president, and has charge of the Buffalo office of the plant. An export sales branch has been established in Grand Central Palace, New York, with Bert G. Close in charge. The company recently bought and now controls the auto fabric accessories division of the Baker & Lockwood Co., which line formerly bore the name of "Baker."

C. J. Larash, for the past five and one-half years Baltimore distributor for the Vim Motor Truck Company, has moved into a new building, erected to take care of his rapidly increasing business. The new quarters cover an area of 22,000 sq. ft., costing $95,000.

The Detroit branch of the Miller Rubber Company, C. F. Faro, branch manager, has moved from its location on Congress St. to larger quarters at 43 Parsons St.

Zimmer-Thien, Inc., is the name of the Walter F. Zimmer Co., Kresge Building, Detroit, Mich. There is no change in personnel.

The Pennsylvania Gear & Machine Co., 435 North Broad St., Philadelphia, Pa., makers of gears and sprockets, have moved into a new plant, Tioga and Weikel Sts., enlarged facilities being needed. About 15,000 sq. ft. are now available.

The Trailmobile Co. announces the removal of its Philadelphia business office from 1416 North Sydenham St. to Room 312, Heed Building.

Trade Literature

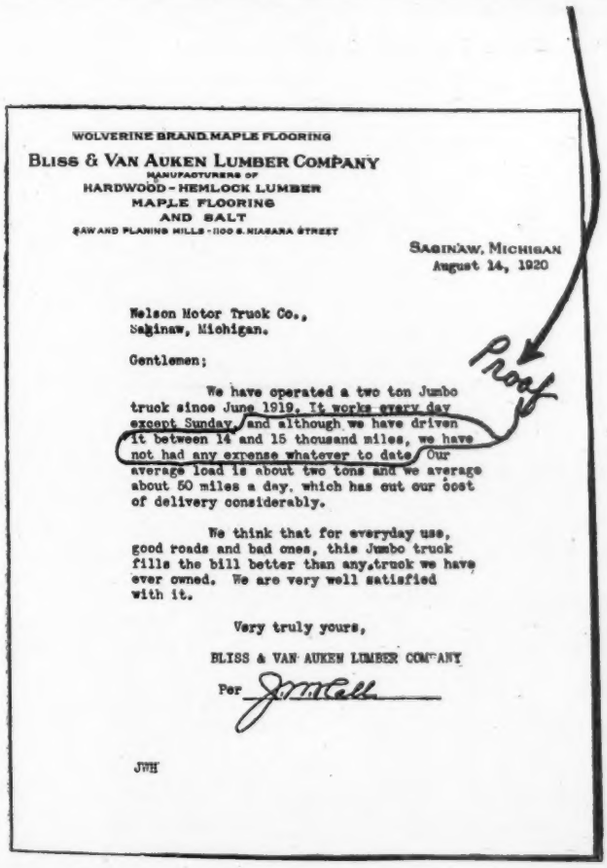
The Story of Rubber is the fascinating subject treated in the August 16 issue of The Mentor, published by the Mentor Association, 114 E. 16th St., New York. There are twelve pages of text, a bibliography for supplementary reading, and 23 illustrations, six of them full-page gravures.

The Story of Gasoline, issued by the Atlantic Refining Company, has 38 pages, 15 illustrations and 3 charts, and has mention of 47 possible engine troubles, and their remedy. It is "the plain, frank story of gasoline, told for its millions of users, the story of American ingenuity and progress."

The Samson Advertising Book for Dealers, issued by the Samson Tractor Co., Janesville, Wis., Division of the General Motors Corp., contains 36 pages of hints and suggestions for dealers. It contains hints for making up a card index of prospects, 6 large advertisements, 6 form letters for following up prospects, 6 large tractor advertisements and five form letters for following up truck prospects, and detailed information about photographs, lantern slides, pennants, portfolios, road signs, etc. It is a handbook for helping the dealer localize his advertising.

Racine Auto Tire Co., Racine, Wis., has guaranteed its price list No. 15 of Horse Shoe tires and tubes up to November 1.

This Jumbo Truck Has Run Over 14,000 Miles Without Repairs



WOLVERINE BRAND MAPLE FLOORING

BLISS & VAN AUKEN LUMBER COMPANY
MANUFACTURERS OF
HARDWOOD - HEMLOCK LUMBER
MAPLE FLOORING
AND SALT
SAW AND PLANING MILLS - 1100 S. NIAGARA STREET

SAGINAW, MICHIGAN
August 14, 1920

Nelson Motor Truck Co.,
Saginaw, Michigan.

Gentlemen;

Proof

We have operated a two ton Jumbo truck since June 1919. It works every day except Sunday, and although we have driven it between 14 and 15 thousand miles, we have not had any expense whatever to date. Our average load is about two tons and we average about 50 miles a day, which has cut our cost of delivery considerably.

We think that for everyday use, good roads and bad ones, this Jumbo truck fills the bill better than any truck we have ever owned. We are very well satisfied with it.

Very truly yours,

BLISS & VAN AUKEN LUMBER COMPANY

Per J. W. Call

JWH

Quality of design, materials and workmanship can safely be taken for granted when such records as this one are common. Many Jumbo owners with records of 20,000 to 30,000 miles have not replaced a single part in more than 3 years hard service. The replacement cost for *all* Jumbo Trucks averages less than $10 per year per truck.

Such performance means good reputation—a powerful factor in the success of Jumbo dealers.

There is a Jumbo Truck for every need—ten models with 6 capacities ranging from 3,000 to 8,000 pounds. Jumbo dealers are therefore enabled to meet the requirements of any haulage problem, all from the Jumbo line.

Increased production facilities enable us to offer a few direct factory contracts on this line of success-building trucks. Write today for the details.

Nelson Motor Truck Company

Saginaw ***Michigan***

The COMPLETE Truck

JUMBO
The Complete Truck

Historic Growth of Sharon Pressed Steel Company

THE company now known as the Sharon Pressed Steel Co. was organized in June, 1919, absorbing the properties and patents of the Hydraulic Drawn Forging Co., Ellwood City, Pa., and purchasing from the Blaw-Knox Co., Pittsburgh, their modern plant at Sharon.

Shortly before the organization the Hydraulic Co. had purchased from Follansbee Bros., Pittsburgh, a concern known as the Pressed Steel Truck Co., owning certain patents and machinery necessary for the manufacture of "Atlas" pressed steel trucks, trailers, tote boxes, and elevating platforms used extensively in textile factories, warehouses, piers and railroad stations; in fact, any kind of equipment for industrial transportation, except tractors. The Ellwood City plant is now engaged in this line of manufacture together with all kinds of light pressing and stamping work.

The Blaw-Knox Co. was a merger of the Blaw Construction Co., a concern doing business at Hoboken, Pa., near Pittsburgh, manufacturing concrete forms and all sorts of structural steel, and a concern known as the Knox Pressed and Welded Steel Co., located at Sharon, Pa., in the buildings now occupied by this company. In order to consolidate equipment and save overhead, the Sharon equipment for the most part was moved to Hoboken, Pa. The contracts had been let to completely dismantle the Sharon plant, tear down and move the buildings, when Messrs. McGill and McIntyre and several other Sharon people laid plans to save the industry for Sharon.

Accordingly, they formed a company known as the Sharon Pressed Steel Co., taking over the plant of the Hydraulic Drawn Forging Co., Ellwood City. The Hydraulic Drawn Forging Co., during the war, worked largely on air craft cylinders and forgings of a like nature.

The Ellwood City plant was completely equipped for light stamping and forging work of all kinds. Upon the formation of the new company the forging machinery was immediately removed to the Sharon plant and additional machinery, all equipped with separate motor drive, was purchased and installed to make this plant a modern, up-to-date pressed steel shop. The Ellwood City plant was remodeled and additional machinery installed to make this plant one of the most modern plants for light stampings and forgings.

Among the prominent men who are connected with the company are: E. E. Slick, formerly vice-president of the Midvale Steel Co.; L .L. Knox, vice-president of the Blaw-Knox Co.; C. K. Strausbaugh, formerly general manager of the Standard Tank Car Co.; William McIntyre, president of the McIntyre Contracting Co.; A. R. McGill, vice-president of the First National Bank of Sharon; A. M. Moreland, formerly treasurer of the Carnegie Steel Co.; Park Bachman, formerly with the Sharon Steel Hoop Co.; J. G. Bassett, attorney-at-law, Pittsburgh; George W. Short, formerly vice-president of the Sharon Steel Hoop Co.; Frank J. Lanahan, manufacturer, Pittsburgh; Josiah Kirby, president of the Cleveland Discount Co., Kirby Bldg., Cleveland, Ohio; W. H. Watkins, superintendent of the Upson Nut Co., Cleveland, Ohio; W. L. Ulmer, vice-president of the Ulmer Mortgage Co., Ulmer Bldg., Cleveland, Ohio; W. J. Parker, of the W. J. Parker Co, Kirby Bldg., Cleveland, Ohio.

The Sharon plant, with its 400 employees, is said to be able to turn out approximately 5000 frames per day. The Elwood City plant now employs 125 men.

The Sharon property, including in addition to the main buildings, the following auxiliary, outlying buildings and equipment: office building, timekeeper's office, pattern shop, acetylene house, large garage, coal tipple, railroad tracks and complete heat treating equipment, covers 93 acres of land. The main building, which is 115 ft. wide by 500 ft. long, equivalent to 57,500 sq. ft. of floor space, is constructed of corrugated iron sides. Besides the daylight admitted through the wooden windows, monitor lights in the roof provide ample radiance for working under all conditions. The 70-ft. main span with a 40-ft. lean-to has a 15-ton crane runway, and other runways and travelling wall cranes of 3-ton capacity. The machine shop, constructed of brick walls, steel sash and which has an Aiken type of composition roof, is 75 ft. wide by 250 ft. long, equivalent to a space of 18,750 sq. ft. The new assembly building for frames, which is 150 ft. wide by 300 ft. long, has also an Aiken type roof and is further made up of brick sides and steel windows.

New Main Sharon Plant and Office Building

The Ellwood City plant consists of 2½ acres of ground, with railroad siding. The main buildings, which are of the mill type, have the following measurements: 322 x 62 ft. and 112 x 68 ft., a total length of 434 ft., or equivalent to 27,616 sq. ft. This plant also includes three garages, oil house, timekeeper's office, boiler house, brick and cement house, machine shop and office.

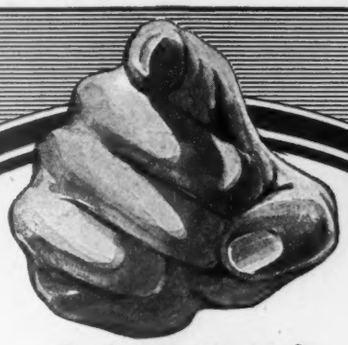
George C. Hubbs
Vice-president and general manager Grant Motor Car Corporation, Cleveland, Ohio.

Josiah Kirby
President Sharon Pressed Steel Company, Sharon and Ellwood City, Pa.

W. J. Parker
Of the W. J. Parker Co., also has interests in the Sharon Pressed Steel Co.

Patriot Reduces Truck Prices

Following the reduction in price of the Stewart truck and several other makes, the Patriot Motors Co., of Lincoln, Neb., announced that its models would be reduced approximately from 10 to 12 per cent. The prices, which took effect October 1, applied to all goods, even those in transit. The firm made the reduction in line with the passenger car manufacturers in an effort to stabilize the trade.



YOU!

Mr. Dealer in 1930

WHAT will your truck tire business be ten years from now?

Will your establishment have prospered by your business foresight and good buying judgment?

Build your foundation *now* on the bedrock of success by stocking the two biggest sellers on the truck tire market today.

The New Mono-twin—a grainless, non-splitting, solid truck tire on a single large base, possessing all the advantages of both the single and dual, without the disadvantages of either.

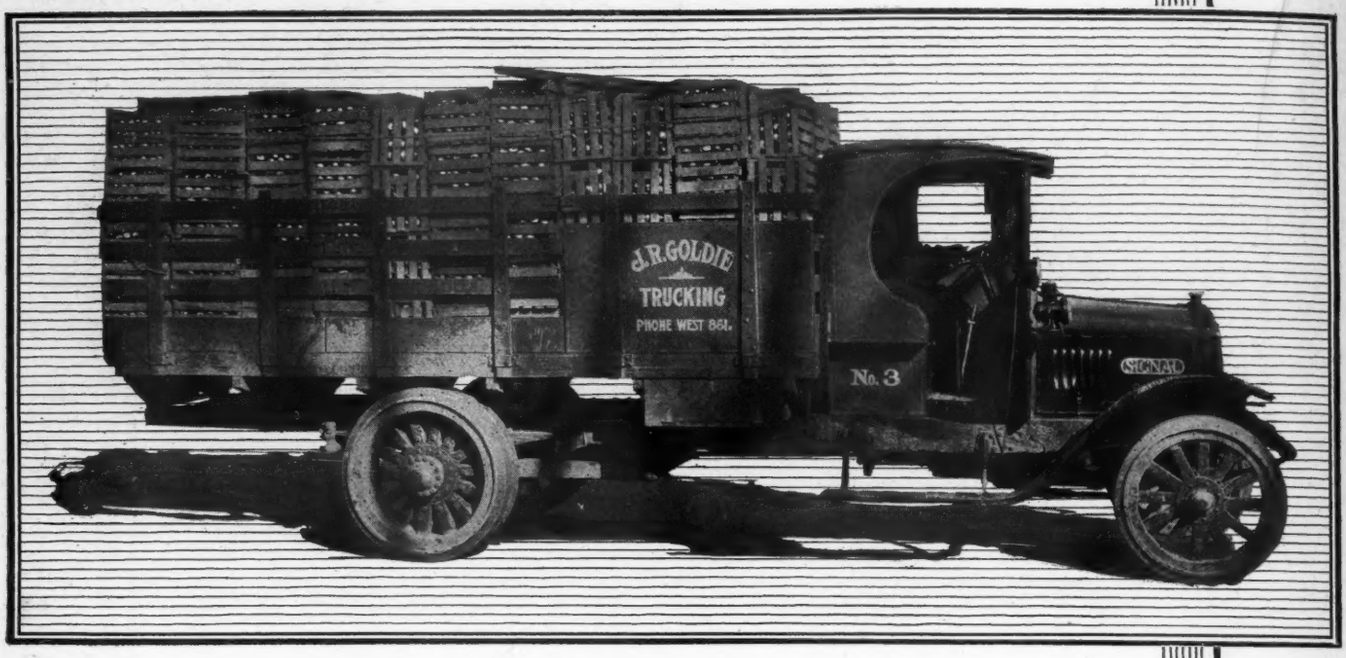
'Nobby Cord'—the pioneer pneumatic truck tire—a sturdy, heavy-duty tire that guarantees your trade a saving in every phase of truck operation.

Stock now for a big demand

'Nobby Cord' *Mono-twin*

United States Tires are Good Tires

You can get a Signal for YOUR Business



Only Two Hours to Lower Prices

On every hand you hear people ask, "Why aren't prices lower?" As a matter of fact lower prices on most food products are almost here. They are only a couple of hours away.

To get right down to brass tacks, it is a matter of miles. Right here in Detroit we are paying the usual high prices for vegetables and fruit, but within forty miles, or two hours by motor truck, vegetables and fruit are rotting for want of a market. The same situation prevails in practically every section of the country.

And while we argue that it is not right, the vegetables and fruit continue to rot.

Don't assail the railroads for their inability to deliver such products to your door. The solution of this wasteful situation is to relieve the railroads of this responsibility and use motor trucks for short hauls. Motor trucks will move short hauls quicker and cheaper—and will BRING PRICES DOWN.

1 to 5 Ton Capacity

SIGNAL

SIGNAL MOTOR TRUCK COMPANY
DETROIT

POLACK
TRUCK TIRES

The Secret of Endurance
Correct Compound

The making of a good, durable truck tire depends upon the quality of the material and their correct production.

Polack Tires have proved by their service what is in them. Pure Hevea rubber is used in unusually liberal quantities and it is correctly toughened so that it gives mileage and yet retains its remarkable resilience. For there is no rubber better than Hevea.

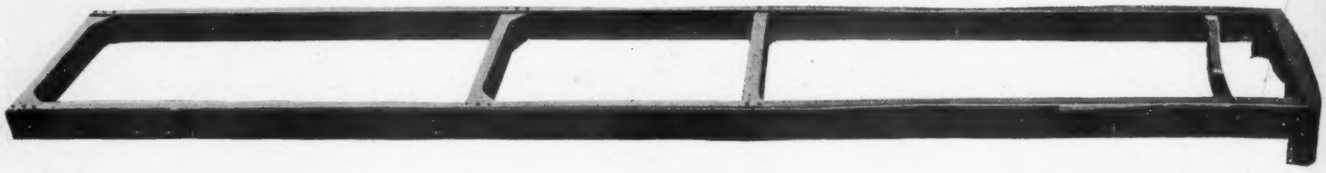
For heavy-duty work—and lots of it—put your trust in Polack Tires.

DEALERS: If you want to represent a good product, write us

POLACK TYRE & RUBBER CO.
1876 Broadway
New York

Subsidiary of the Buckeye Rubber Products Co.
Cleveland, Ohio

SINCE 1899 WORLD'S STANDARD



Two plants with a combined floor space of over 100,000 square feet for the manufacture of

FRAMES

In our Sharon and Ellwood City plants we have ample facilities for handling your quality frame requirements. Complete heat-treating and other equipment, a well united organization, quality materials, insure you absolutely satisfactory results. ***Send us your specifications.***

SHARON PRESSED STEEL CO., Sharon, Pa.

Josiah Kirby, President

Board of Directors

E. E. Slick, formerly Vice-President of the Midvale Steel Co.
L. L. Knox, Vice-President of the Blaw-Knox Company
C. K. Strausburg, formerly General Manager of the Standard Tank Car Company
William McIntyre, President of the McIntyre Contracting Company
A. R. McGill, Vice-President of the First National Bank of Sharon
A. M. Moreland, formerly Treasurer of the Carnegie Steel Co.
Park Bachman, formerly with the Sharon Steel Hoop Co.
J. G. Bassett, Attorney-at-Law, Pittsburgh
George W. Short, formerly Vice-President of the Sharon Steel Hoop Company.
Frank J. Lanahan, Manufacturer, Pittsburgh
Josiah Kirby, President of the Cleveland Discount Company, Kirby Building
W. H. Watkins, Superintendent of the Upson Nut Company, Cleveland, Ohio
W. L. Ulmer, Vice-President of the Ulmer Mortgage Company, Ulmer Building, Cleveland, Ohio
W. J. Parker, of the W. J. Parker Company, Kirby Building, Cleveland, Ohio

One of Ten Sanford Trucks Owned by the Towanda Construction Company of Towanda, Pa.

If Your Ideal is Customer Satisfaction—

THE Sanford MOTOR TRUCK

Models:
2½, 3½, 5 Ton

If you believe in selling the type of truck that exactly fills each customer's needs—even if that means foregoing a possible greater profit—

If you believe that getting the customer's signature on the "dotted line" is not the completion but the beginning of the transaction—

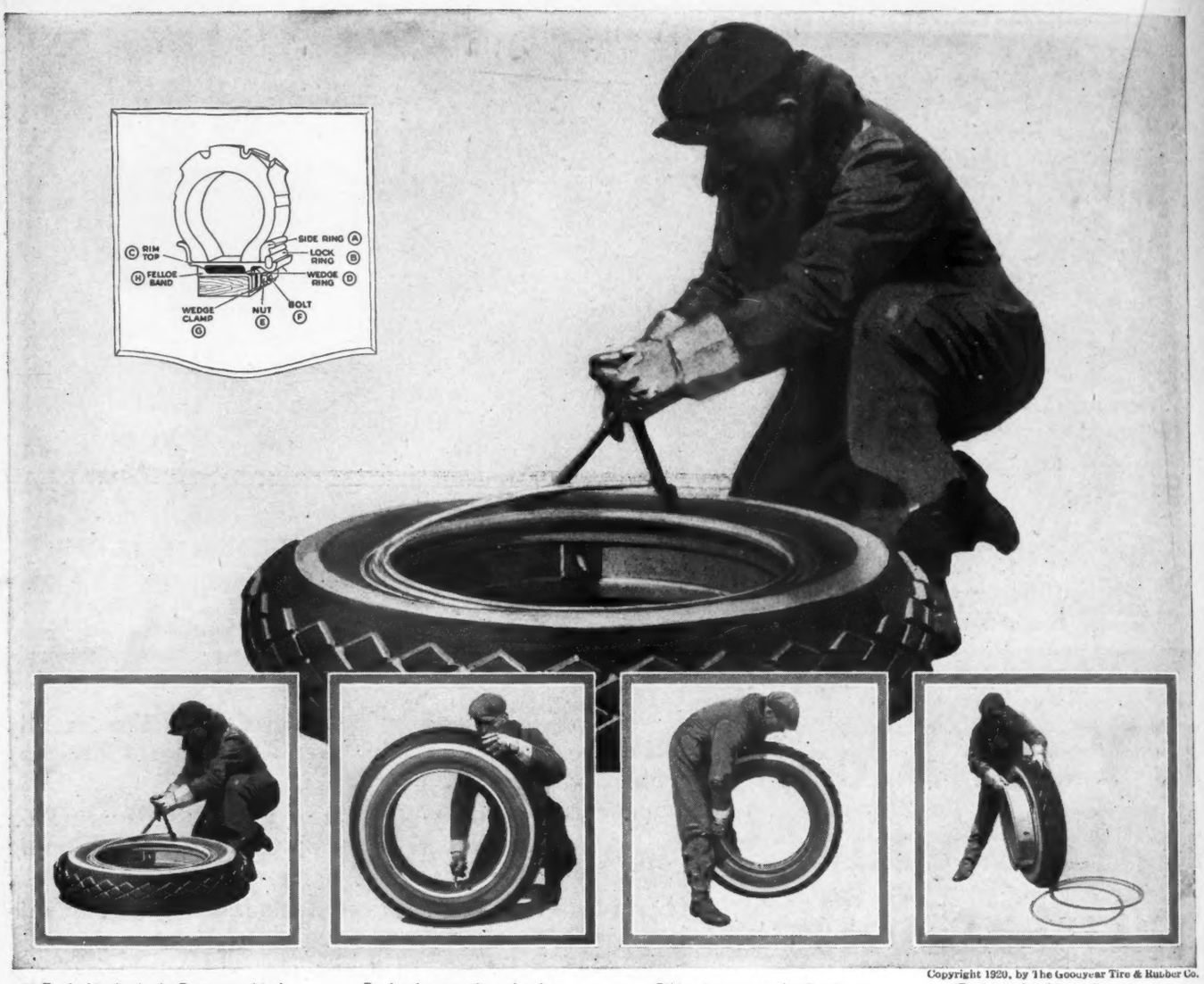
If you believe that customer-satisfaction on the first sale is a certainty only when you obtain a re-order—

Then you're the type of dealer that measures up to the Sanford standard. *And you'll find it very much worth your while to get in touch with us.*

Sanford Motor Truck Co.
Syracuse
N. Y.

Sanford

WORM DRIVE MOTOR TRUCKS



Push side ring back. Remove oval lock ring by forcing tire tool under loose end and around entire circumference.

Push valve stem through valve hole into tire with tire tool.

Slide rim around in the tire and at the same time pull off.

Remove rim from tire; remove flap and tube from tire.

Copyright 1920, by The Goodyear Tire & Rubber Co.

Unusual Ease of Operation—Goodyear Truck Rims

AT the time Goodyear pioneered the straight side tire, Goodyear also pioneered the straight side type of rim—to make this type of tire wholly practical.

So marked by simplicity and strength was this original rim that certain of its chief characteristics have been generally retained in straight side rims of today.

One of its principal mechanical advantages, however, still remains a Goodyear advantage, an exclusive Goodyear feature; it is the oval lock ring.

Because of its oval contour, this ring is easy to apply or remove, with the result that the rim is readily locked or unlocked; and due to its simplicity, it holds the rim rigidly in place when in the locked position.

The best evidence that the rim is advantageous to such a degree is found in the substantial recognition given it by truck manufacturers.

Write to The Goodyear Tire & Rubber Company, at Akron, Ohio, or Los Angeles, California, for further information about these easily operated Goodyear Truck Rims, in demountable and detachable types.

GOODYEAR

TRUCK RIMS

Quality
TANKS
BODIES & HOISTS
"Made by Heil"

Standard Equipment on ACE trucks. The trucks shown were equipped by The Heil Co. with combination "4 in 1" Bodies and Hydro Hoists, and were sold to contractors in Des Moines, Iowa. Hydro Dumping Equipment makes it possible for contractors to haul coal, gravel, cement blocks, beams, light bulk material—all perhaps on the same day.

HEIL'S COMBINATION BODIES

Meet Every Trucking Need—Fit Every Truck

The two sets of removable sides and double acting tail gate enable it to be changed from a coal body to a platform body in a few minutes. Its usefulness is further increased by the Hydro Hoist which allows the body to be placed just back of the cab, giving proper load distribution. It is the most compact, highly efficient and direct acting hoist on the market.

We have valuable information for you regarding equipment for Contractors, General Trucking Companies, Building Supply Dealers, and others. Write for literature.

THE HEIL CO.

1143 MONTANA AVENUE MILWAUKEE, WISCONSIN

MOTOR NASH TRUCKS

Wilson & Company is among the many nationally known firms who have given the Nash Truck a thorough tryout and evidenced their opinion by adding further to their Nash equipment.

Nash Trucks Assure Economical Hauling

WHEREVER continuous, economical motor truck schedules must be maintained, the installation of Nash Trucks has proved to be an unusually wise transportation investment.

Nash Trucks are scientifically built to meet maximum stresses and strains, by the big Nash organization at Kenosha, skilled by long experience in the manufacture of trucks of high value.

A country-wide organization of over 1500 Nash distributors and dealers, each one required to be ready at all times to render prompt, intelligent, and courteous service, insures full satisfaction to every Nash Truck owner.

Nash Trucks: One-Ton Chassis Two-Ton Chassis Nash Quad Chassis

The Nash Motors Company, Kenosha, Wisconsin

Manufacturers of Passenger Cars and Trucks, Including the Famous Nash Quad

Nash Motor Sales Limited, Toronto, Ont., Distributors of Nash Cars and Trucks for the Dominion of Canada

NASH MOTORS

"Wilson—*That's Haul*"

"Worm drive exclusively," says the J. C. Wilson Company, everlastingly hammering home this fact, and pointing to it as one of the big reasons why no Wilson Truck has ever yet worn out.

All four Wilson models are built on Timken-Detroit Axles, the kind you'll find under 60 well built makes of American motor trucks.

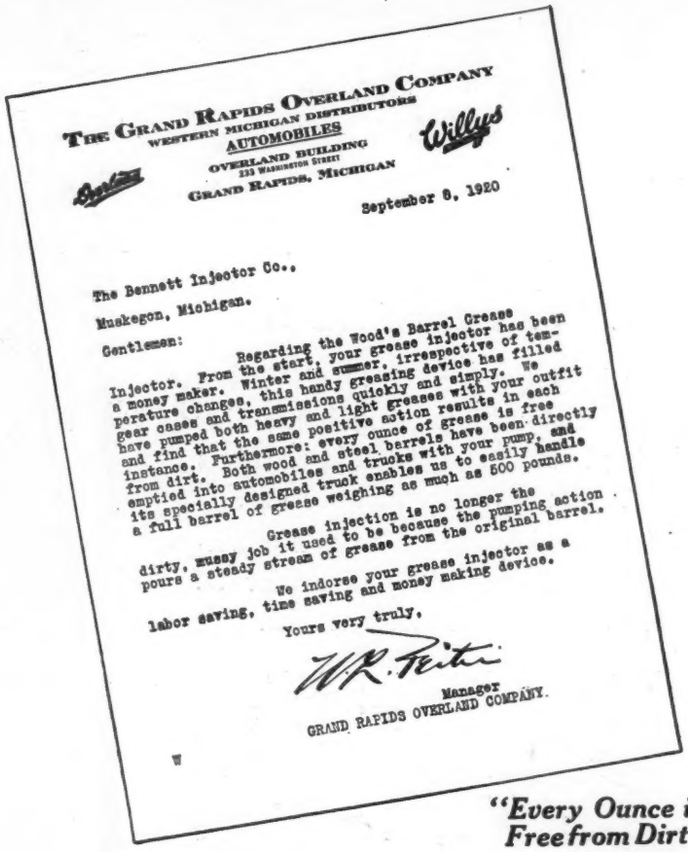
Abbot-Downing
Acason
Ace
Acme
*Ahrens-Fox
Armleder
Atterbury
Available
Brinton
Brockway
Chicago
Clydesdale
Collier
Dart
*Denby
Diamond T
Dorris
Equitable
Facto
Fageol
Federal
G. M. C.
Garford
Gary
Hahn
Hendrickson
King-Zeitler
Kissel
Kleiber
Koehler
Lewis-Hall
Maccar
Master
Menominee
Michigan Hearse
Minneapolis
Moreland
National
Nelson & LeMoon
New England
Oneida
Paige-Detroit
Parker
Rainier
Sandow
*Seagrave
Selden
Service
Signal
Southern
Standard
Sterling
Sullivan
Tegetmeier & Riepe
Tower
Ward LaFrance
Walker-Johnson
White Hickory
Witt-Will
Wilson

Front Axles

THE TIMKEN-DETROIT AXLE COMPANY
Detroit, Michigan

TIMKEN-DETROIT AXLES

Read What Users Say



THE GRAND RAPIDS OVERLAND COMPANY
WESTERN MICHIGAN DISTRIBUTORS
AUTOMOBILES
Willys Knight
OVERLAND BUILDING
233 WASHINGTON STREET
GRAND RAPIDS, MICHIGAN

September 8, 1920

The Bennett Injector Co.,
Muskegon, Michigan.

Gentlemen:

Regarding the Wood's Barrel Grease Injector, from the start, your grease injector has been a money maker. Winter and summer, irrespective of temperature changes, this handy greasing device has filled gear cases and transmissions quickly and simply. We have pumped both heavy and light greases with your outfit and find that the same positive action results in each instance. Furthermore: every ounce of grease is free from dirt. Both wood and steel barrels have been directly emptied into automobiles and trucks with your pump, and its specially designed truck enables us to easily handle a full barrel of grease weighing as much as 500 pounds.

Grease injection is no longer the dirty, messy job it used to be because the pumping action pours a steady stream of grease from the original barrel.

We indorse your grease injector as a labor saving, time saving and money making device.

Yours very truly,

W. R. Smith
Manager
GRAND RAPIDS OVERLAND COMPANY.

W

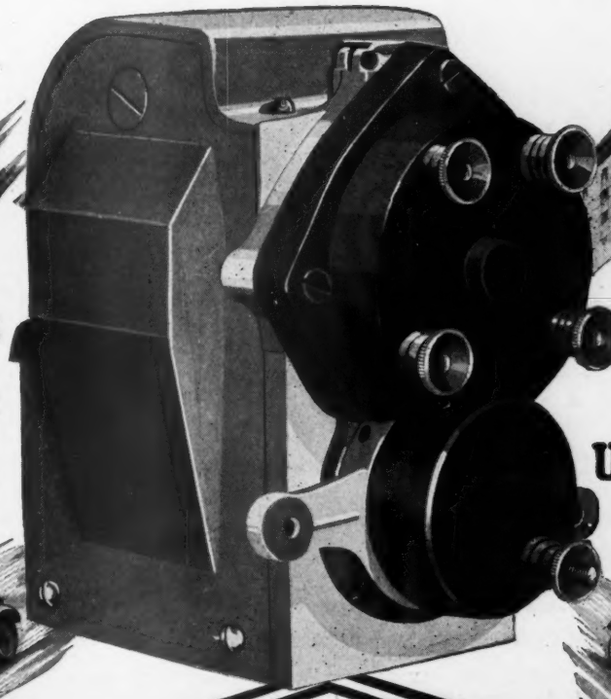
"Every Ounce is Free from Dirt"

GARAGE MEN

This is what you need. A Wood's Barrel Grease Injector that quickly and accurately pumps all grease in all weather. *Every ounce is free from dirt.* Fits all barrels. Send today for complete information. It means additional profits for you.

Bennett Injector Company **Muskegon, Michigan**

Don't Overlook This "POWER-FUL DIFFERENCE" in MAGNETOS



ORDINARY MAGNETOS Fire Like This

→ ← → ←

Two Way Sparks of Unequal Intensity

The New SPLITDORF Aero MAGNETOS Fire Like This

→ → → →

Uni-Directional Sparks Always the Same

TRADE

SPLITDORF

MARK

ESTABLISHED 1858

SPLITDORF ELECTRICAL CO. Newark, N. J.

WORLD'S LARGEST MAKERS OF IGNITION EQUIPMENT

GILLIAM
TAPERED ROLLER
BEARINGS

LOOK AT THAT BATTERY OF ROLLERS

Gilliam Bearings have more, longer and larger rollers, which gives them maximum carrying capacity and makes them run smoothly and easily.

Gilliam Bearings have greater endurance, due to their scientific system of lubrication. The concave ends of the rollers serve as lubricant reservoirs and as the bearing revolves the lubricant is drawn to the contact surfaces by capillary attraction. The flanges on the cage hold the lubricant in the zone of friction, thus insuring them against lubricant starvation which causes 95% of all bearing troubles.

The heavy one-piece steel stamped cage has no minor parts nor riveted joints to become loose and cause trouble.

These features, combined with precision, superior workmanship and careful selection of materials, give **Gilliam Bearings** an exclusive place in the automotive field.

Gilliam Bearings are manufactured under the supervision of a group of men who have had years of experience in the Taper Roller Bearing field.

THEY LAST LONGER BECAUSE THEY ARE STRONGER

THE GILLIAM MANUFACTURING CO.

CANTON, OHIO

Detroit Offices: 965 Woodward Avenue

Where Does the New Order of Things Find You?

Conditions have changed. The seller's market of yesterday is the ***buyer's*** market of today, and all over the country the sharpened edge of competition's blade is beginning to make itself felt.

No longer is the truck buyer at his wits end where to buy a truck. He is on the other side of the fence today. Where he once chose hurriedly and frantically, he now selects calmly and dispassionately.

That being the case, where do ***you*** fit?

Does it find you secure in your position as the dealer in the dominant value-giving motor truck in America today—DAY-ELDER—or does it find you with a "weak sister" on your hands that hasn't a fighting chance in a broadly competitive market?

Revised Prices:

MODEL A
1-1½ tons
Chassis Capacity Including Weight of Body
3500 Pounds
$2100

MODEL B
1½-2 tons
Chassis Capacity Including Weight of Body
4500 Pounds
$2300

MODEL D
2-2½ tons
Chassis Capacity Including Weight of Body
6000 Pounds
$2750

MODEL C
2½-3 tons
Chassis Capacity Including Weight of Body
7000 Pounds
$2950

MODEL F
3½-4 tons
Chassis Capacity Including Weight of Body
9000 Pounds
$3750

MODEL E
5-6 tons
Chassis Capacity Including Weight of Body
14,000 Pounds
$4600

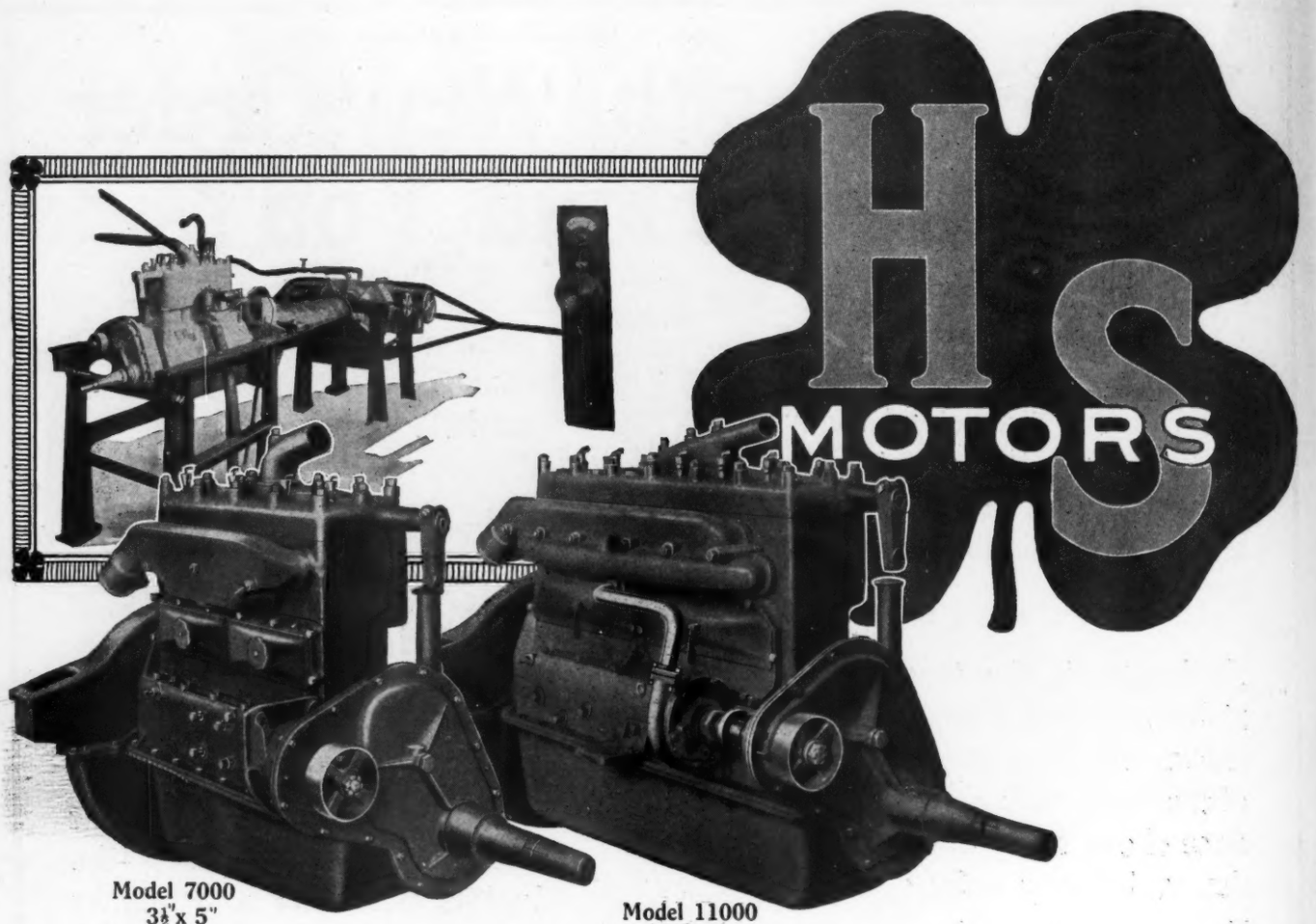
Your decision ***now*** will determine your future status in motor truck selling in your community.

With the DAY-ELDER line of six models you are ***secure***—master of a situation that competition cannot assail—the logical contender and winner of the bulk of the motor truck sales in your vicinity.

Write us and we will lay before you a powerful and convincing array of facts on DAY-ELDER supremacy that will make you realize that what we have told you in the preceding paragraphs are ***facts.***

DAY-ELDER MOTORS CORPORATION NEWARK, N. J., U. S. A.

DAY-ELDER
Worm-Drive Motor Trucks



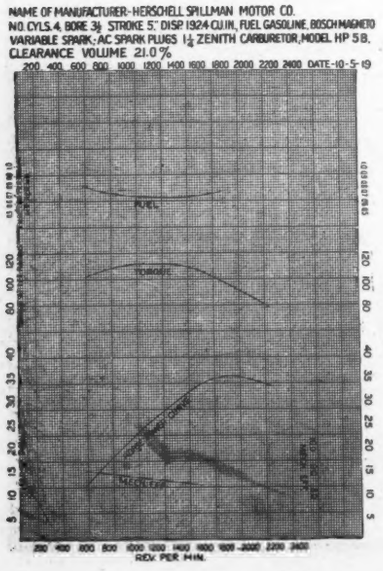
Model 7000
3½" x 5"
Four Cylinder

Model 11000
3¼" x 5"
Six Cylinder

POWER PLUS

In the compact, self-enclosed Herschell-Spillman motors—models No. 7000, 3½ x 5, four cylinder, and No. 11000, 3¼ x 5, six cylinder—is embodied generative power unsurpassed by other motors of the same cubic inch displacement.

This latent driving force, held in leash to meet exigencies, means reserve speed to the car owner, and to the truck owner excess power under all conditions of road and load.


NAME OF MANUFACTURER - HERSCHELL SPILLMAN MOTOR CO.
NO. CYLS. 4, BORE 3½ STROKE 5" DISP. 1924 CU IN, FUEL GASOLINE, BOSCH MAGNETO
VARIABLE SPARK; AC SPARK PLUGS 1½ ZENITH CARBURETOR, MODEL HP 5B.
CLEARANCE VOLUME 21.0 %
FUEL
TORQUE
REV PER MIN.

Such reliant performance is credited to the practical, trap-free design of these motors—selected materials—careful workmanship—thorough testing and rigid inspection—qualities of manufacturing which can be achieved only in a plant as adequately equipped as the Herschell-Spillman plant and directed by men with automotive experience of twenty years' standing.

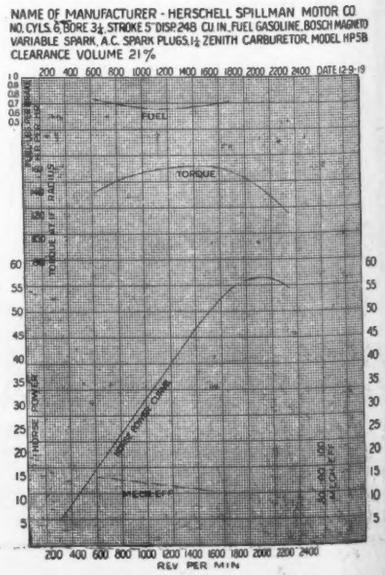
Herschell-Spillman Motor Co.

Established 1900

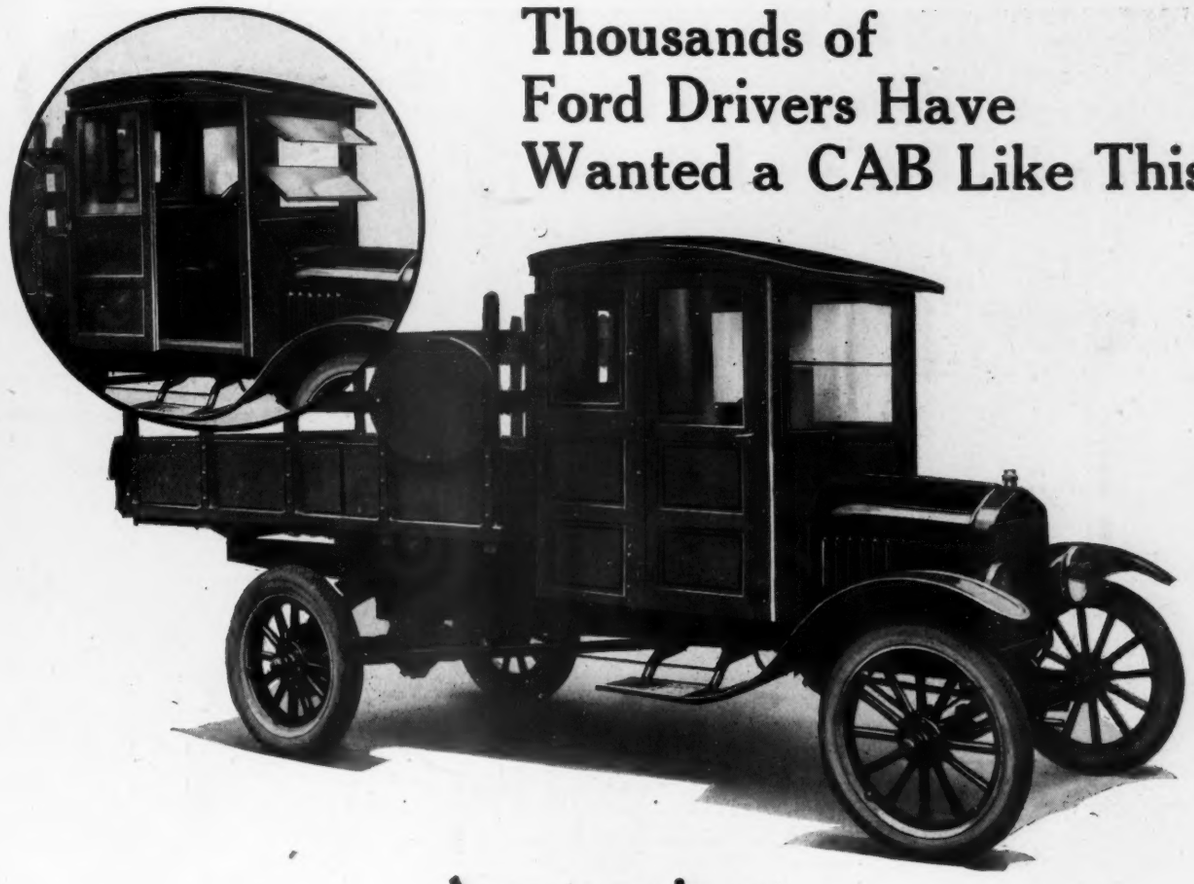
North Tonawanda, N. Y.

Located eight miles from Buffalo, on the lines of New York Central, Erie, and Lackawana Railroads, and Niagara Falls Trolley, affording unsurpassed transportation facilities.

National advertising carries the story of H-S four and six cylinder motors to several million magazine readers each month


NAME OF MANUFACTURER - HERSCHELL SPILLMAN MOTOR CO.
NO. CYLS. 6, BORE 3¼ STROKE 5" DISP. 248 CU IN, FUEL GASOLINE, BOSCH MAGNETO
VARIABLE SPARK, A.C. SPARK PLUGS, ½ ZENITH CARBURETOR, MODEL HP 5B
CLEARANCE VOLUME 21 %
FUEL
TORQUE
REV PER MIN

Thousands of Ford Drivers Have Wanted a CAB Like This!



Announcing the New

BABCOCK VESTIBULE CAB

FOR FORDS

Built Strictly According to Babcock Quality Standards of Construction

Specifications:

Windshield built in metal frame as one unit—both lights ventilate *in and out*.

Driver's Seat has Spring Cushions, full width Lazy Back, upholstered in imitation leather.

Both Vestibule Doors hinged to swing clear back against side of cab, and are equipped with Ventilator Hooks to hold them open about four inches.

Right Door only has Lock. Left Door is secured by two inside Thumb Buttons to afford access for repairs and ventilation.

Glass in doors and right-hand quarter Window is stationary. Left-hand quarter Window on driver's side swings up and fastens inside against roof.

Windows are of extra depth to give driver maximum field of vision.

Rear Window slides up to give an opening of about 8 inches, and is fastened by Thumb Screws, which prevent rattling.

Constructed to ship KNOCKED DOWN in 5 units. Vestibule Doors are hung in frame as a unit, hinges and locks in place—No fitting required. All units go together with steel angles.

Every Cab is first erected, holes drilled and bolts put in place at factory, so a misfit is *impossible*.

FINISH: Green blacked off, or gray with black stripes. Windshield and rear panel black to bottom of window.

WEIGHT: About 275 pounds.

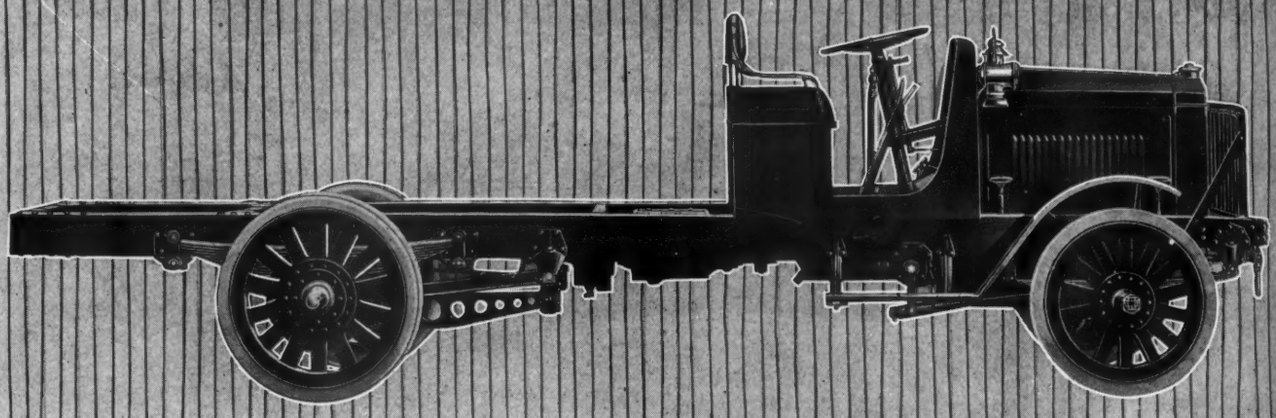
Produced in Quantity at Popular Price

Dealers: The demand for these cabs to replace open cabs and seats will be tremendous during the next few months. Get ready by securing our proposition.

H. H. BABCOCK COMPANY

WATERTOWN, FOUNDED 1845 NEW YORK.

New York: A. J. Diefenderfer Corp.
Chicago: C. J. Holdrege & Co.
Boston: Babcock Sales Co.
Cleveland: Babcock-Ohio Co.
Philadelphia: Diamond Body Co.
Minneapolis: Northern Sales Co.



AMERICAN LAFRANCE
COMMERCIAL TRUCKS

There has been one great underlying factor which has caused ninety per cent of American cities to select American-LaFrance Fire Apparatus to protect them from fire loss.

That factor is the thoroughness with which American-LaFrance apparatus is built.

In American-LaFrance apparatus is found a sturdiness that enables it to run over rough roads at high speeds carrying a weight equal to a commercial truck, and then pump water until the fire is extinguished.

Service of this kind shows that American-LaFrance motors and American-LaFrance construction are long past the experimental stages.

American-LaFrance Commercial Trucks are closely related in all manufacturing and assembling essentials to this famous American-LaFrance fire apparatus and may be depended upon to meet every requirement of truck users.

Write for Complete Information

AMERICAN-LAFRANCE FIRE ENGINE COMPANY
OF NEW JERSEY

Factory
Bloomfield, N. J.

New York Sales Office
250 West 54th Street

Cooling Systems embodying Long Spiral Tubing were adopted as standard for War Trucks—they are equal, as well, to all peace time requirements

THE system of automotive radiation that is recognized as *paramount—supreme*—in its vast field; the system that eliminates the hazards, the disappointments, the failures, by placing at the command of the producer, the skilled, experienced, *specialized services of engineers* who study the requirements of *every* motor for *every* purpose. A record of 18 years of unequalled accomplishments is assurance of valuable co-operation.

No engine can be more efficient than its cooling system.

Look to it then that your motor be permitted to realize its maximum of efficiency through the aid of a cooling system engineered to suit its requirements.

LONG MANUFACTURING CO., DETROIT, MICHIGAN

Pioneer Makers of Cooling Systems for Gasoline Engines

LONG

COOLING SYSTEMS

The Recognized Standard for Tractor, Trucks and Motor Cars.

The AUTOMOTIVE TRAILER

Will Save Many a Truck Sale for You

Capacities:
½ to 20 tons

Models:
Semi-Trailers, Pole Trailers } 2 and 4 Wheel

Types: 7

WHEN a customer needs a 5 ton motor truck and you can show him nothing higher than a 3 ton truck—will you lose the sale?

Not if You Carry a Line of Automotive Trailers

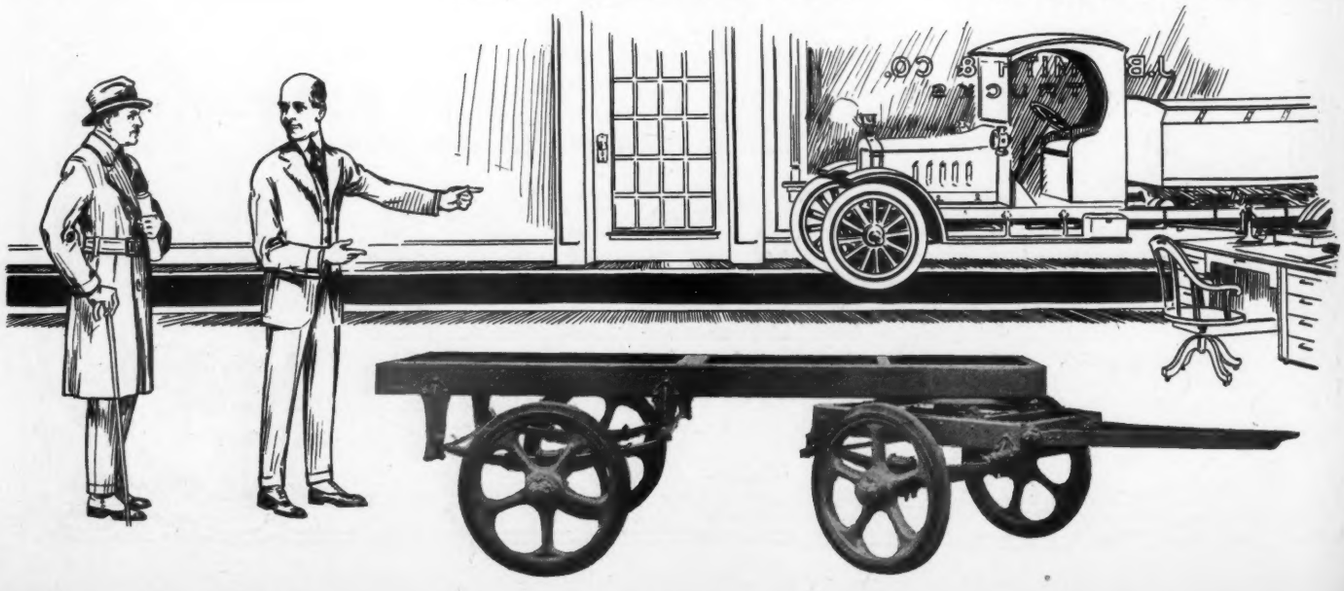
A 2 ton Automotive will save that sale; give your customer efficient, economical transportation—and you a two-way profit.

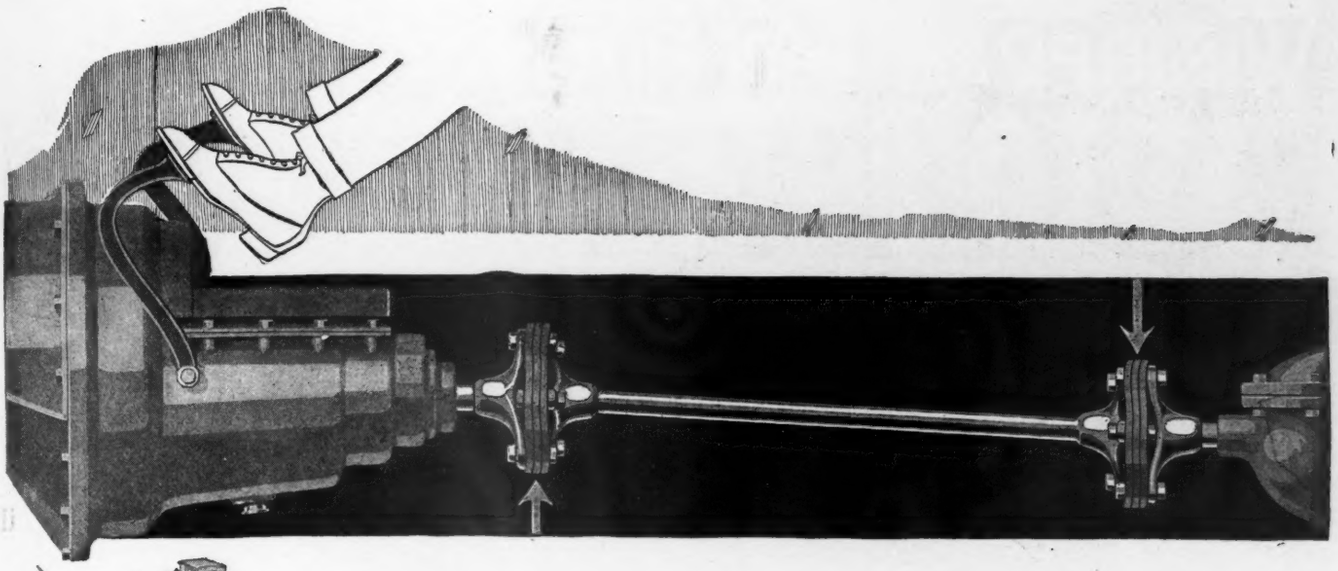
Your present selling force can easily handle the Automotive. Explain to your salesmen that your trucks can haul three times their rated capacity with Automotives. Note how eagerly they'll avail themselves of the opportunity to save truck sales with Automotives.

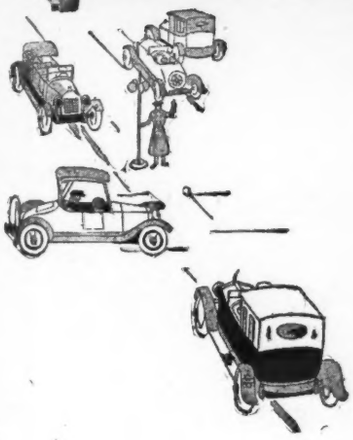
This high quality Trailer possesses distinctive constructional features which minimize depreciation and greatly reduce operating cost. The roller bearing turntable assures perfect tracking. Side sway and wearing are entirely eliminated. Oil-less bearings throughout automatically provide perfect lubrication. Steel wheels with hubs cast integral insure perfect alignment and long life to tires.

Write for Complete Details of Our Sales Proposition

Automotive Trailer Corporation
General Offices and Factory Springfield, Illinois







Backlash eliminated

A frequent source of serious automobile trouble removed

ENGINE running smoothly—plenty of power—and yet—jerks, rattles and lost motion in the gears and bearings.

Ever since the automobile has been in use car owners have had this condition to contend with.

Backlash—that's the trouble. It comes from *metal* universal joints. It is a danger signal.

Metal universal joints fail to cushion the shocks of starting, shifting gears, or driving over rough roads. They transmit every blow and jar. They quickly wear loose—causing backlash.

Cushioning the shocks that wear out a car

To eliminate backlash and its accompanying troubles, the Thermoid-Hardy Universal Joint has been perfected. It is constructed of flexible fabric discs which cushion the racking blows. It transmits a smooth, even flow of power instead of lost motion and rattles.

Having no metal-to-metal wearing surfaces the Thermoid-Hardy Joint needs no lubrication. It cannot wear loose.

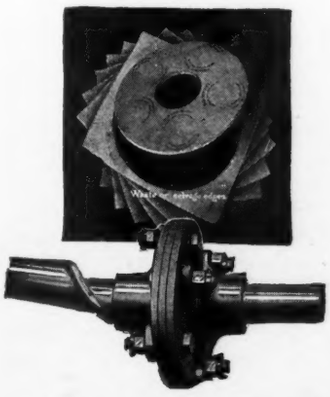
On many passenger cars as well as heavy-duty trucks it has run 60,000 miles without replacement or adjustment of any kind. Over fifty manufacturers have adopted the Thermoid-Hardy Joint as standard equipment.

Enormous strength of the flexible fabric joint

The patented fanwise construction of the flexible fabric discs gives the Thermoid-Hardy Universal Joint its extraordinary strength. This unique construction, shown below, is the only way in which uniform strength and elasticity can be obtained.

Your customers will be quick to appreciate the advantages of the Thermoid-Hardy Joint on their trucks.

Send for advance proofs of the national advertising campaign and our new book, "Universal Joints—Their Use and Misuse." The book will give you in detail the construction of the Thermoid-Hardy Joint, records of performance, opinions of leading engineers and manufacturers who have adopted it.



In building up the flexible fabric discs the several layers of fabric are put together so that the strands in each piece run in a different direction. This patented fanwise construction provides the greatest tensile strength. In a laboratory test made recently at Purdue University the drive-shaft, itself, was twisted at a total stress of 21,700 inch pounds without injury to the universal joint.

Thermoid Rubber Company

Sole American Manufacturers

Factory and Offices: Trenton, N. J.

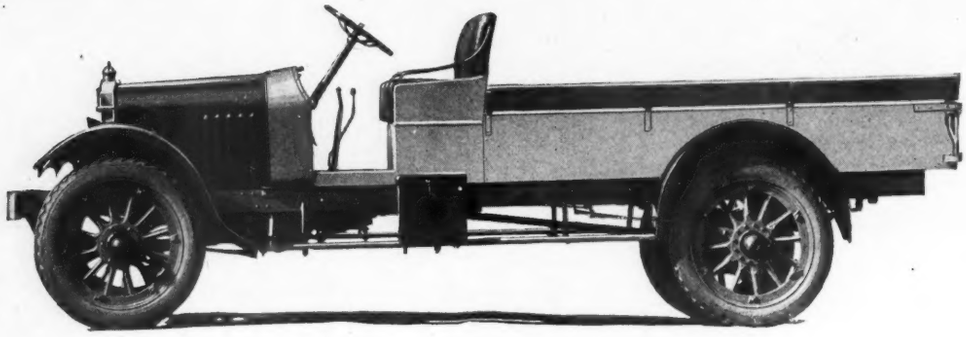
New York Chicago San Francisco Detroit Cleveland Atlanta Philadelphia Pittsburgh Boston London Paris Turin

THERMOID-HARDY UNIVERSAL JOINT

Fanwise construction for strength

Makers of "Thermoid Hydraulic Compressed Brake Lining" and "Thermoid Crolide Compound Tires"

WINTHER MOTOR TRUCKS KENOSHA WIS.



"The Winther Delivery Special"

In the "Winther Delivery Special" the discerning dealer can foresee tremendous possibilities.

He can visualize its ready market with the merchant, the grocer, the laundry company, the farmer, etc., because the "Delivery Special" possesses sturdiness, speed and operating economy to an exceptional degree.

He can appreciate, moreover, the completeness of the Winther line, which also includes 1½, 2, 3½, 5 and 7 ton models in the rear drive type, and 1½ and 2½ ton four-wheel drives.

The farsighted dealer, in fact, will be interested in having complete details on the Winther contract—information that we will gladly supply on request.

Electric lighting and starting; pneumatic cord tires; speedometer, bumper, and Alemite lubricating system are included in the "Delivery Special" chassis price

$1795

WINTHER MOTOR TRUCK COMPANY

Manufacturers of Motor Trucks and Motor Cars

KENOSHA, WISCONSIN

6000 Gallons a Day Delivered to Ford Cars by 3 Victory Visible Pumps

Read the following story from the May 26th issue of National Petroleum News:

Service Station Starts Thousands of New Fords on Their Way Home

Detroit, May 14—More gasoline is put out daily by the wayside Service Station, out Woodward Avenue, opposite the Ford Factory, than by any other service station in the country, it is likely, certainly more than thru any other station of its size.

On many days during the past two months this station, thru three pumps, has put out better than 6,000 gallons of gasoline.

The reason is this: Since the switchmen's strike interrupted the freight movement, purchasers of new Ford cars and agents in other cities in many cases have been driving their new cars home from the factory, rather than trust to their delivery by railroad.

The Ford cars as they leave the plant have neither oil nor gasoline to carry them very far, and their drivers almost without exception stop at the Wayside Service Station across the street to fill up before starting to drive home.

At all hours of the day lines of new Ford cars are to be seen waiting for their fills of oil and "gas." In a large vacant tract alongside the station there are solid rows of new cars, their drivers making ready to start for home and watching their turn to get near one of the three gasoline pumps.

L. A. Thomas and D. T. Tracy run their station with the aid of two boys. Their record day, they believe, was one Monday about two weeks ago when they took care of about 965 new Fords, giving them an average of eight gallons of gasoline and from one to three quarts of oil, a total amount of 7,500 gallons of gasoline. The station has storage capacity for 6,000 gallons and frequently more than this amount is dumped there daily. The Sinclair Refining Company, which furnishes the station its gasoline, uses a monster 7½ ton truck with a tank capacity of 2,700 gallons, which is in service almost exclusively to keep this station supplied.

And Every Customer Saw What He Got and Got What He Saw

Mr. Dan T. Tracy, one of the partners in the Wayside Service Station, writing to an inquirer last February, said:

"We have three Tokheim Pumps in operation at our service station which dispenses more gas than any other filling station in the City of Detroit. These pumps give the customer full measure, causing the friendly co-operation of all patrons. Satisfied customers are the best kind of advertisements. Our average gallonage during pleasant weather is 4,500 gallons of gas a day, and the combined reading of our three pumps up-to-date is 571,801 gallons. Two of the pumps having been operated a year, and the other one nine months.

"We formerly used three men at our station, but two men with the Tokheim Pumps are able, now, to give the same service as three men gave with the five-gallon stroke hand pumps. Customers are pleased with the visible containers of the Tokheim Pumps, because they see and get exactly what they pay for.

"We think so much of Tokheim Pumps that we use the name 'Tokheim' on our cards and literature."

Tokheim Oil Tank & Pump Company
1603 Wabash Ave. Fort Wayne, Ind.

WDF
Quality Forgings

QUALITY
DROP FORGINGS

FOR

AUTOMOTIVE CONSTRUCTION

SPECIALISTS IN THE MANUFACTURE OF

I-BEAM FRONT AXLE FORGINGS

WESTERN DROP FORGE CO.

MARION, INDIANA

Traffic Truck

4,000 LBS. CAPACITY

The Transportation World has turned to Trucks

The industrial and commercial world has turned to the motor truck. Its great economy has proclaimed it essential to and for business.

The Traffic has been accepted in the entire field of handling units as the most economical motor-driven utility that exists for any business. It is a business builder for the man who uses it and the man who sells it.

Thousands of owners are handling with Traffics a traffic accomplishment that has proved in practice the theory [illegible] former [illegible]-lb. capacity truck has ever [illegible]

Traffic Truck

4000 LBS. CAPACITY

Dealers who have turned to Traffic Trucks need no further encouragement for success. It is without a single competitor in the entire motor world.

While its remarkably low price of $1595 is an outstanding feature, and has been made possible only through quantity production, its quality stands as a challenge to trucks of similar capacity which cost the purchaser hundreds of dollars more. Read the specifications, then you'll "tell the world" just as others do who know the Traffic.

Produced in the largest factory in the world devoted exclusively to the building of 4,000-lb. capacity trucks only—where specialization and standardization have made it possible to produce a Traffic Truck every ten minutes.

Backed by a big and financially strong organization, soundly established and here to stay, insures to the dealer a permanent and profitable connection in the automotive business.

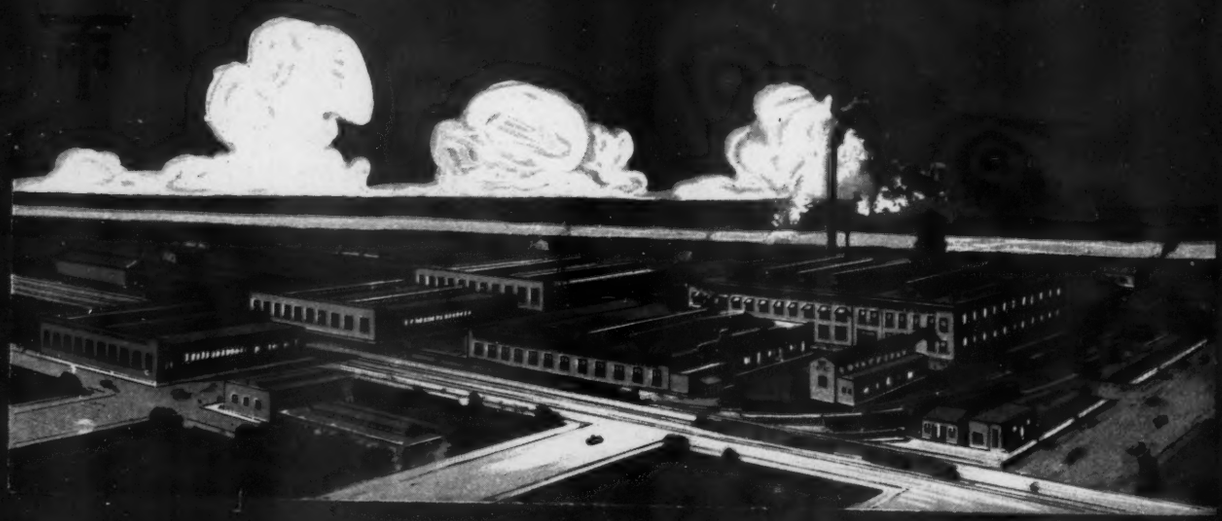
Increased production will make it possible to extend our wide dealer organization now operating throughout the United States and fourteen foreign countries.

Dealers who can appreciate what a direct factory connection means can avail themselves of an opportunity to grow with the world's fastest growing industry by registering now for territory.

Act quickly—don't write a letter. Wire at our expense. If your territory is open, we will arrange for contract. Don't wait till tomorrow—wire today.

Specifications:

Red Seal Continental 3¾x5 motor; *Covert transmission;* multiple disc clutch; *Bosch magneto; Center carburetor;* 4-piece cast shell, cellular type radiator; drop forged front axle with *Timken roller bearings; Russel rear axle,* internal gear, roller bearings; semi-elliptic front and rear springs; *8-in. U-channel frame; Standard Fish tires, 34x5 front, 34x5 rear; 156-inch wheelbase; 122-inch length of frame behind driver's seat;* oil cup lubricating system; chassis painted, striped and varnished; drop wheelbase seat and cushion regular equipment. Pneumatic cord tire equipment at extra cost.



Traffic Motor Truck Corporation St. Louis, U. S. A.

Largest exclusive builders of 4,000-lb. capacity trucks in the world

Save the Cost of Neglect

Neglected lubrication exacts a heavy toll in premature wear and breakdown.

"Nigrum" (impregnated hardwood) Oil-less Bushings, by their ability to function smoothly in spite of neglect, afford a welcome protection against these costly dangers.

We also manufacture "Bound Brook" graphite-and-bronze Oil-less Bushings.

All Genuine Graphited Oil-less Bushings have always been made at Bound Brook, U. S. A.

BOUND BROOK OIL-LESS BEARING COMPANY

Specialists in the manufacture of Oil-less Bushings for more than a third of a century

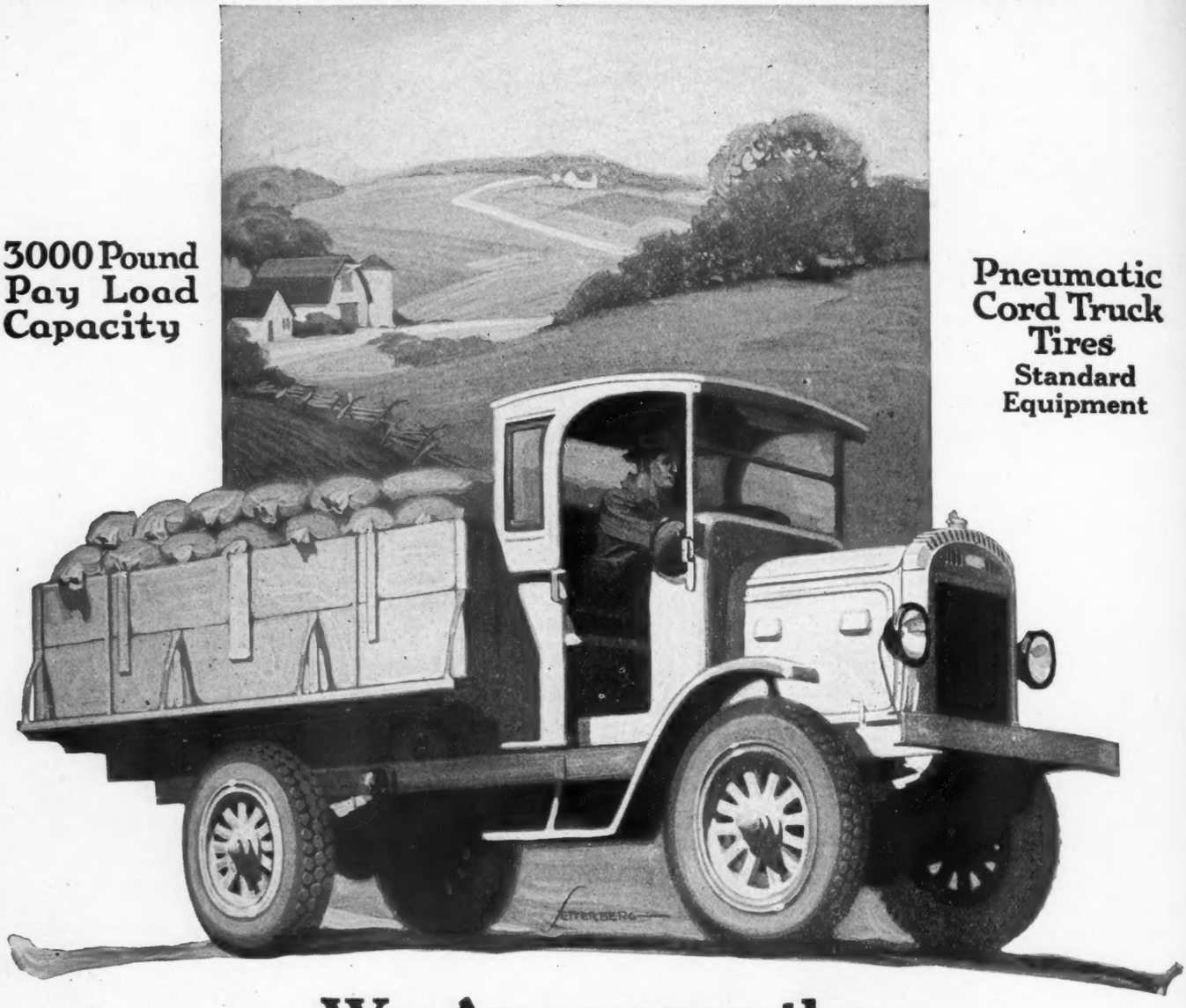
Bound Brook New Jersey

Detroit Office: 1723 Ford Bldg.

MOLINE
Farm Motor Truck

3000 Pound Pay Load Capacity

Pneumatic Cord Truck Tires Standard Equipment



We Announce the Moline Farm Motor Truck Model 10

An important addition to the Moline System of Farming with Power, with features of design and construction that are necessary to its success on the farm, yet readily adaptable to city commercial use. It goes out to take its place among the trucks of the world with all the pride and experience of the Moline Plow Co. behind it.

Deliveries now. ***Write our nearest Branch for details.***

MOLINE PLOW CO.

Moline
Atlanta
New Orleans
Dallas
Oklahoma City
St. Louis
Poughkeepsie
Baltimore
Los Angeles
Indianapolis
Stockton
Spokane

MOLINE

—Building the Retailer's Business

EVERY FARMER in your territory—every year—is a prospect for something in the *Moline Line*, from a walking plow to a complete system of power farming.

The Moline Tractor and Moline Implements—tractor and horse-drawn—have given the Moline Dealer big sales and big profits.

The Moline Motor Truck broadens his opportunity. It is an appropriate addition to a great line.

Moline Implements—Reliable standard implements for use with horses and with tractors—every one with points of merit that make profitable sales.

The Moline Tractor—The correct farm power plant, that does all field and belt work, including cultivating, with one man.

The Moline Truck—The right farm transportation unit—dependable and economical—built to the Moline Standard.

The Moline Contract—A new contract that builds a greater retail business with a policy of sales that benefits the farmer, the community, and the manufacturer, *but most directly, the dealer.*

The opposite page illustrates but one part of the Moline Line. Other advertisements to follow will illustrate Moline Horse-Drawn Implements, etc.

MOLINE, ILLINOIS

Portland
Salt Lake City

Columbus, Ohio
Denver

Kansas City
Omaha

Minneapolis
Jackson, Mich.

Sioux Falls
Des Moines

Bloomington, Ill.
Memphis

REYNOLDS

Quality Motor Trucks Present to Responsible Distributors a Greater Opportunity for Profit.

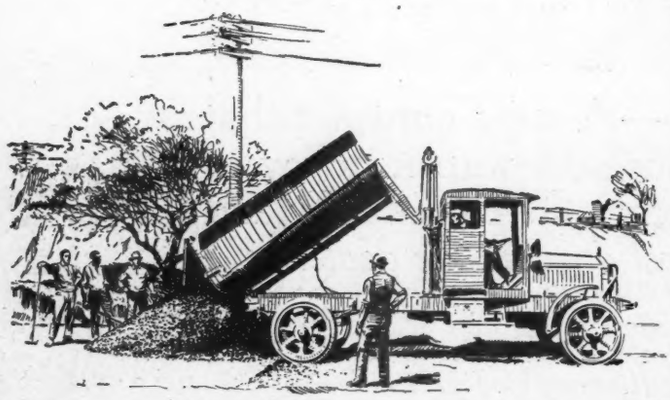
Read the Reason Why!

IN building Reynolds trucks we have followed out a definite ideal. We have no engineering hobbies to try out on the public. The Reynolds line represents not merely the whims of any one person, group of persons or any one locality, but the combined advantages of what has already proved practical in the hands of users in all parts of the world.

The Reynolds is strictly a quality truck built with exclusive regard to continued, trouble-free service under every conceivable condition. It costs more than a good many trucks, simply because it is worth more.

A feature of immediate recognition in the Reynolds is its complete equipment. Every model is equipped with all-steel cab, windshield, starting and lighting, Boyce Moto-Meter, electric horn, Vesta truck battery, front bumper, radiator guard, towing hooks, trailer hook, hub odometer, front fenders, vacuum tank and a tool kit so complete as to answer any emergency.

1½ to 5 tons net load



THE Reynolds dealer and distributor proposition is created for you to make money. We are well aware of your difficulties in present-day competition and financing. For that reason we are coming to you with a new and greater support.

First, we are building a truck into which the finest points of every good truck are embodied. Then we are shipping this truck from the factory complete with every useful equipment.

Second, we are giving you a longer discount to equip you with the margin that will permit more vigorous selling effort than your competition can afford.

Third, we pay the greater share of the advertising in your local newspapers. You know the value of such direct appeal to your customers. We, too, appreciate the impetus it gives to sales and we are willing to stand the greater part of the cost.

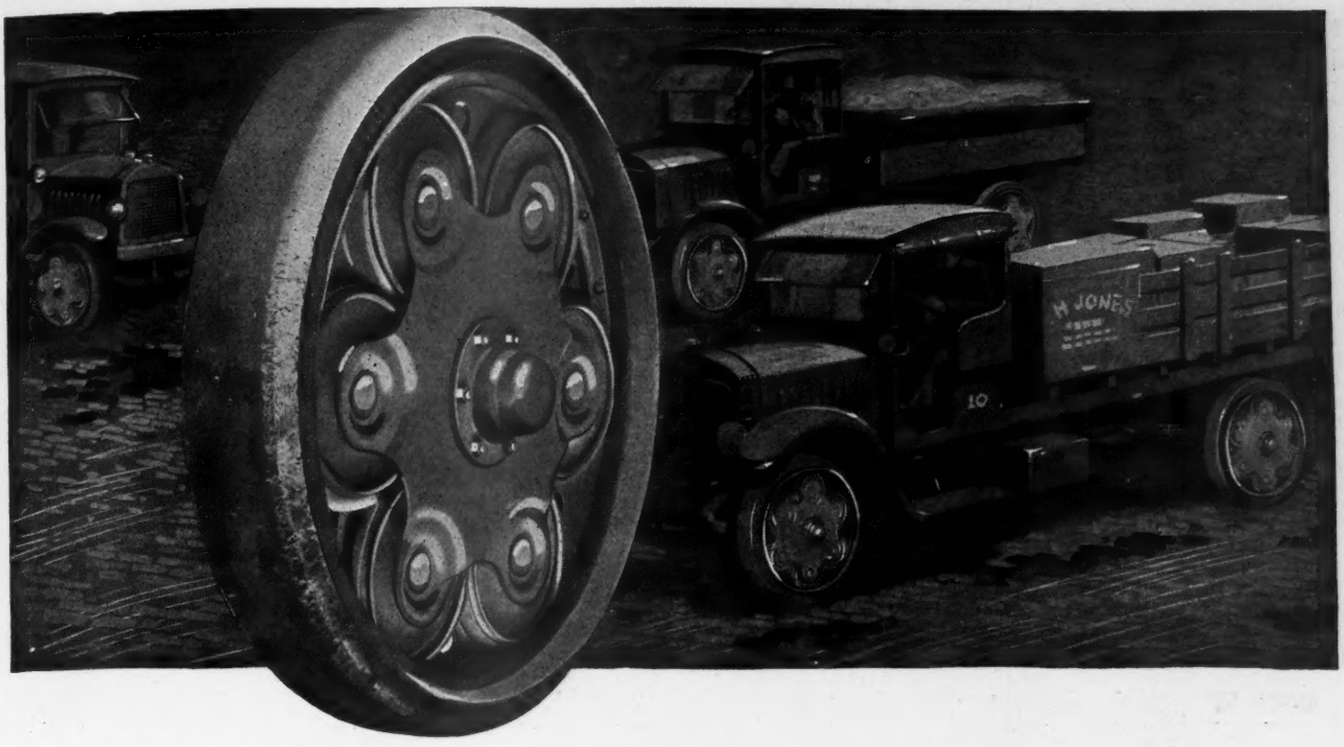
Fourth, we will co-operate with you in presenting the Reynolds company to your financial connections. The Reynolds will bear a financial investigation of the most vigorous kind.

A limited quantity of Reynolds will be produced, an amount in keeping with finest workmanship and in-built quality rather than attempt to supply the demand. This production will be distributed through forty responsible distributors and dealers. These dealers will be assured dependable delivery and the Reynolds company will be assured of experienced, conscientious sales effort before a connection is made.

There are still valuable territories available. Possibly you can have a Reynolds franchise. Write or wire if you are interested.

REYNOLDS MOTOR TRUCK COMPANY

Mt. Clemens :-: :-: Michigan



How Fleet Owners Are Reducing Motor Truck Operating Costs

More and more fleet owners are reducing motor truck operating costs by equipping their trucks with Jaxon Full Floating Wheels.

Jaxon Full Floating Wheels are most resilient wheels. Road shocks and vibrations are absorbed by the six rubber cushions within the wheels.

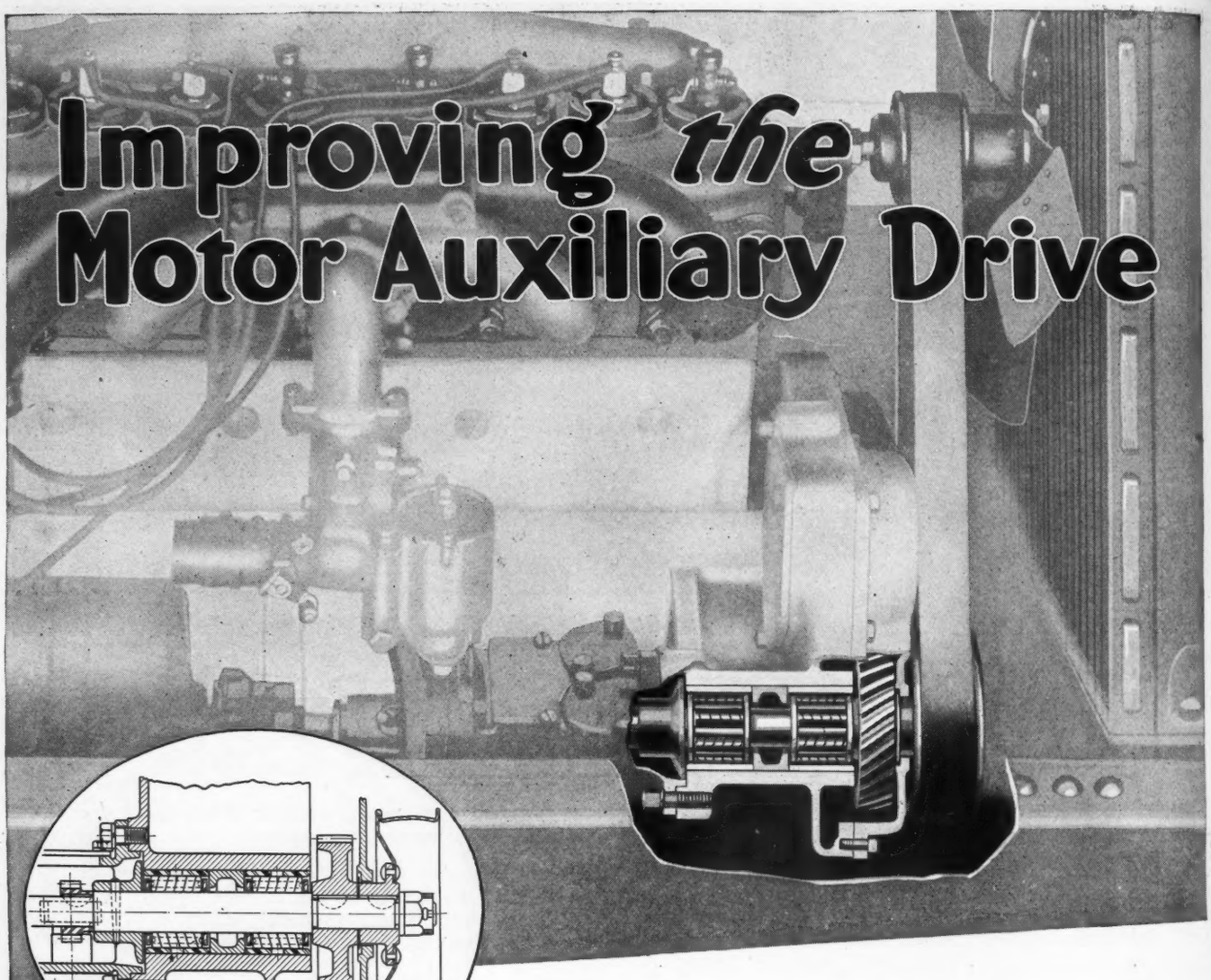
This absorption of shock and vibration results in decreased mechanical repairs, less depreciation to truck and load, greater hauling area, and longer life for the truck—to say nothing of increased tire mileage and greater fuel economy.

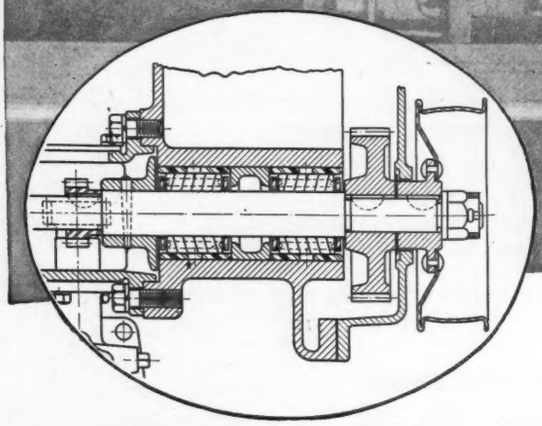
That's how by equipping their trucks with Jaxon Full Floating Wheels fleet owners are reducing motor truck operating costs to a remarkable degree.

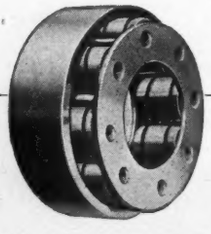
Jaxon Steel Products Company
Jackson *Department C-11* **Michigan**

JAXON
FULL FLOATING WHEELS

Improving *the* Motor Auxiliary Drive







In Operation

Hyatt Roller Bearings add to the life and dependability of the auxiliary drive shaft by maintaining a proper alignment of gears and insuring maximum use of lubrication.

Operating faithfully without interruption, their use in this location is proving entirely satisfactory on many trucks.

Hyatt Roller Bearings are self-oiling, self-cleaning, and never require adjustment. They are efficient, economical and dependable.

THE auxiliary shaft of this truck motor drives the water pump, oil pump and magneto; in addition, carrying at its forward end, a fan belt pulley.

Two Hyatt Roller Bearings, operating directly upon the hardened shaft surface, support the loads from the overhung gear and belt pulley. End thrust from the helical gear is conveyed to the water pump casing through shoulders on the pump impeller.

This construction illustrates one of the ways in which Hyatt Roller Bearings help the Motor builder; making possible a quiet, steady running, long-lived auxiliary shaft mounting.

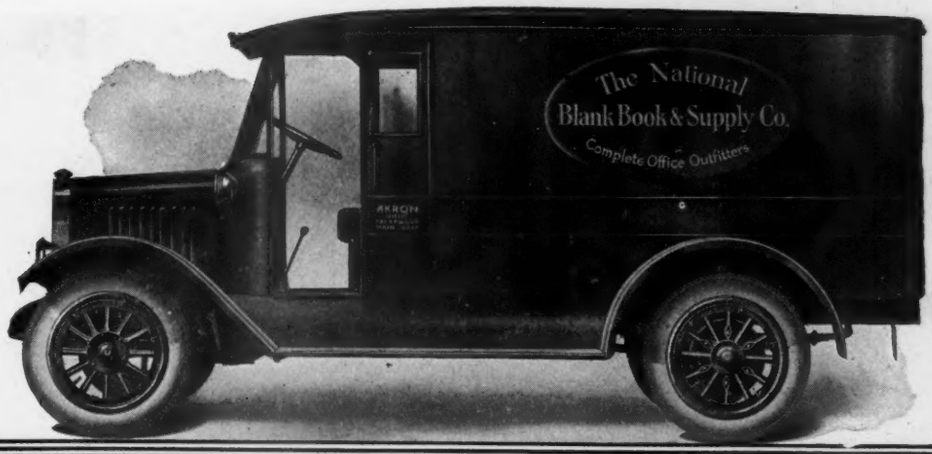
HYATT ROLLER BEARING COMPANY

Motor Bearings Division — Detroit, Michigan

Tractor Bearings Division — Chicago, Ill.

Industrial Bearings Division — New York, N. Y.

HYATT QUIET BEARINGS



HIGH-SPEED DELIVERY HAS BECOME A NATIONAL NECESSITY

The biggest development of recent years in the motor truck industry is being brought to a climax at Kent, Ohio, where the Thomart Motor Company has completed production plans for

A New Super-Quality 2000 pound Speed Truck to supply the vast and immediate market which is waiting for exactly this product

Bankers have expressed their willingness to co-operate in financing sales of the character for which this truck is expressly built.

Progressive dealers can obtain
full data on request

THE THOMART MOTOR COMPANY

Everett Building, Akron, Ohio ***Factory: Kent, Ohio***

QUALITY SNAP RINGS

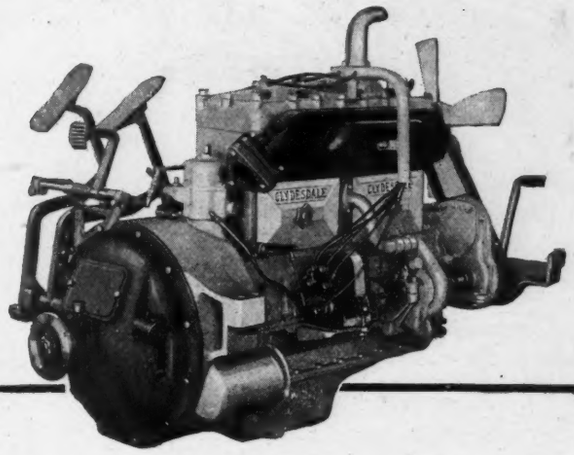
After certain operations have been performed, rings are carefully inspected for uniformity of thickness.

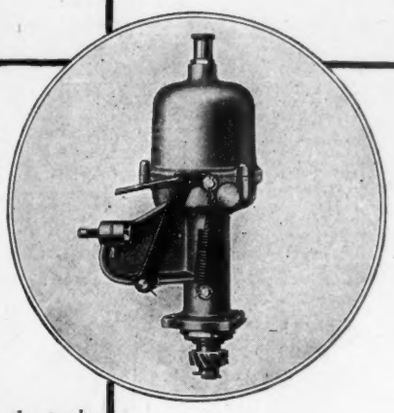
"More Than a Million a Month"

THE Piston RING COMPANY

MUSKEGON, MICH.

In every sense a truck motor, with the added advantages of the Clydesdale Controller to protect it and lengthen its life.





No other truck has it—"The Driver Under the Hood"

How the New Clydesdale Motor Saves Gas and Oil

ON Wednesday morning, June 30th, two Clydesdale 1½-ton trucks started from the factory in Clyde, Ohio, in charge of drivers from the distributor in Philadelphia, Pa.

Both trucks arrived in Philadelphia the evening of July 3rd, having traveled 595 miles.

One truck, equipped with the old type of motor, consumed 100 gallons of gas and 3¼ gallons of oil.

The other truck, equipped with the new Clydesdale motor with a five bearing crankshaft, *and loaded with one ton of parts*, consumed only 68 gallons of gas and 1½ gallons of oil, a remarkable saving considering its load.

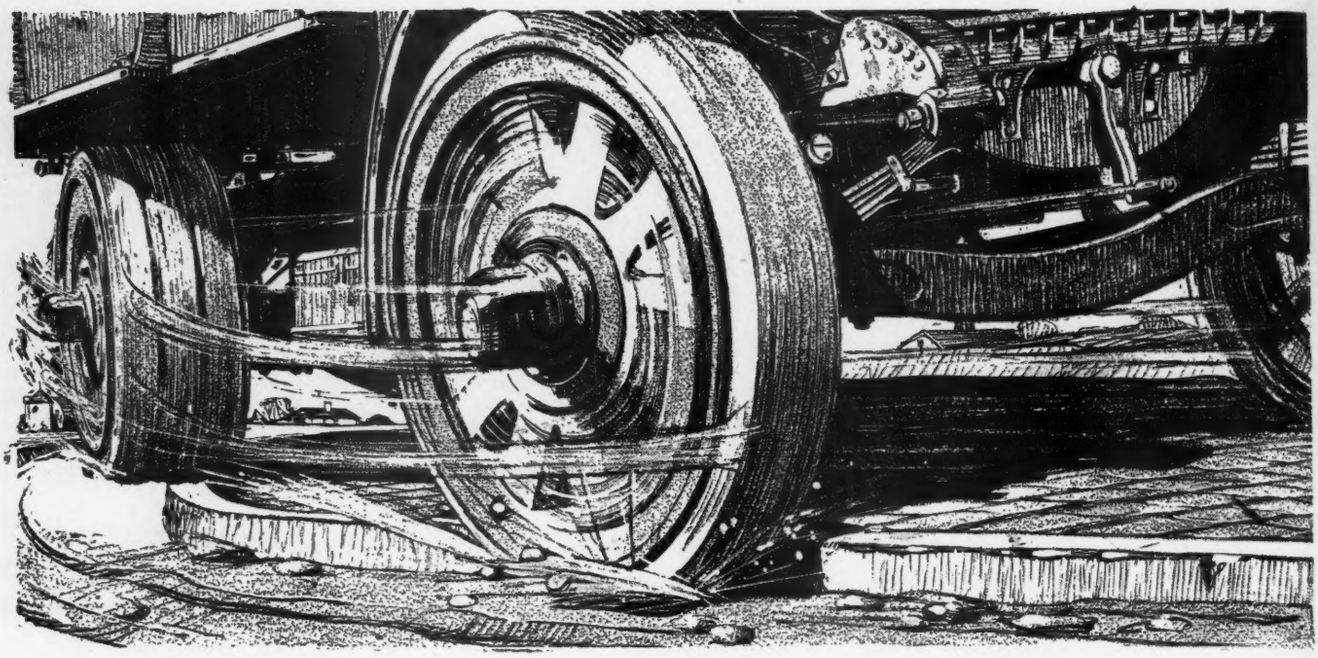
This comparison is not meant to show any performance record, but simply to demonstrate the fact that the new Clydesdale motor affords a distinct saving because it is designed for the Clydesdale truck and is not merely a stock motor adapted to a certain chassis.

Such a difference is worth while considering when comparing various trucks.

THE CLYDESDALE MOTOR TRUCK COMPANY
CLYDE, OHIO

CLYDESDALE

MOTOR TRUCKS



TIMKEN
TAPERED ROLLER BEARINGS

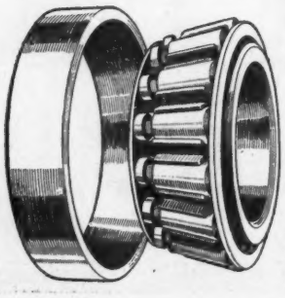
Off!

You can't measure the shock! You can't figure the strain! But she must keep right on rolling, regardless!

That puts it up to the bearings. To hold wheels true and in line; to minimize and compensate frictional wear; to provide strength with not a single ***unnecessary*** ounce of weight; to resist tremendous loads from any and every direction;—that's the sort of performance you have a right to expect from your bearings, year after year.

And Timken Tapered Roller Bearings are for these tough jobs!

At Points of Hard Service



Timken Tapered Roller Bearings are used in the great majority of automotive vehicles at points of hard service:

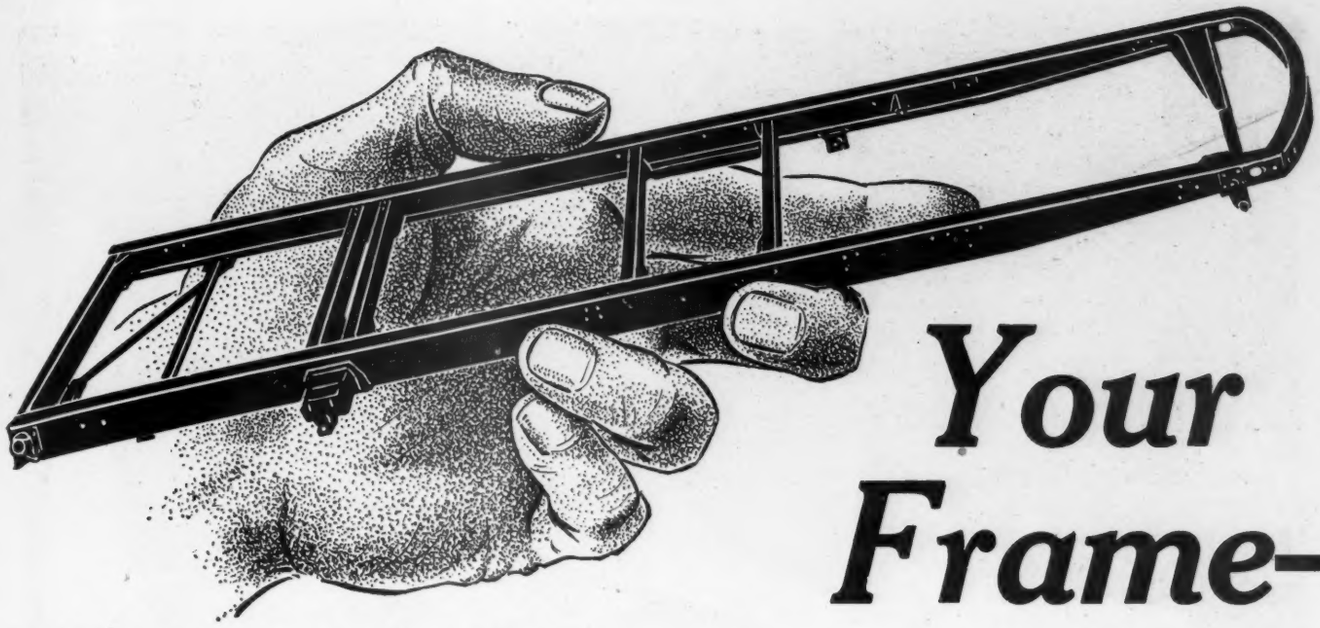
Transmission — Pinion Shaft
Front Wheels — Differential
Rear Wheels — Steering Knuckle
Rear Axle Gears—Worm Gear, Internal Gear, Bevel, and Double Reduction.

This leadership is established on the tapered principle of design, quality of manufacture, performance on the road, and service to the automotive industry.

THE TIMKEN ROLLER BEARING CO., Canton, O.

Plants manufacturing complete bearings at
Canton, O.; Columbus, O.; Birmingham, Eng.; Paris, France
General Offices, Steel, Rolling and Tube Mills, Canton, Ohio

Timken Tapered Roller Bearings for Trucks, Passenger Cars, Tractors, Trailers, Farm Implements, Machinery, and Industrial Appliances



Your Frame—

Will It Safely Carry Tonnage With Speed?

Motor truck drivers *will* send their vehicles loaded to capacity, at top speed.

Under this terrific pounding will your frame finally sag and throw out of alignment the chassis units it is designed to keep fixedly in place?

Or will it have the enormous elastic strength to absorb this constant punishment?

Have Parish & Bingham make the foundation—the Frame—of your assembly and *know* that it will not warp, sag or crystallize *for the life of the truck.*

The character of the special analysis carbon steel used; the rigid chemical tests it undergoes; the thorough gusseting and riveting—assure you the quality of Frame only Parish & Bingham can produce.

Send Us Your Blueprints

PARISH & BINGHAM CORPORATION, Cleveland, Ohio

Other P & B Pressed Steel Products:

Axle Housings—Axle Housing Covers—Brake Drums—Step Hangers—Torque Arms—Running-Boards—Engine Pans.

Parish & Bingham

FRAMES AND PRESSED STEEL PARTS

REG. U. S. PAT. OFF.
Empress
Standard Factory Equipment
SERVICE
Empress No. 52 Style D Oil Cup
Empress No. 5739 Oil Cup
Empress No. 116 Hinge Lid Elbow Oil Cup

EMPRESS GREASE and OIL CUPS

Dominant factors for perfect lubrication on the thousands of SERVICE motor trucks in daily use

EMPRESS No. 52 STYLE D OIL CUPS

This cup, as used here, is one of the larger sizes of the No. 52 oilers and is made from steel; is also made from brass and furnished in nickel plated and polished brass finishes. Eight sizes. The flip cover makes oiling possible from any direction, the cup is operated by the spout of the oil can. This oiler is self-closing and positively dust-proof. Not affected by vibration.

EMPRESS No. 5739 WICK FEED OIL CUPS

Of the wick feed reservoir type, this cup provides a constant regulated flow of oil which flushes grit from the bearings and keeps them well lubricated at all times.

Made in two sizes from both brass and steel; furnished in Nickel Plated Rough Steel and in Nickel Plated and Polished Brass finishes. Dust-proof. Not affected by vibration.

EMPRESS No. 116 HINGE LID ELBOW OIL CUPS

A strong well made hinge lid oiler, pressed from rolled sheet steel, will give long service, standing up under all kinds of usage. Its large unobstructed oil passage makes this cup suitable for packing with waste if desired.

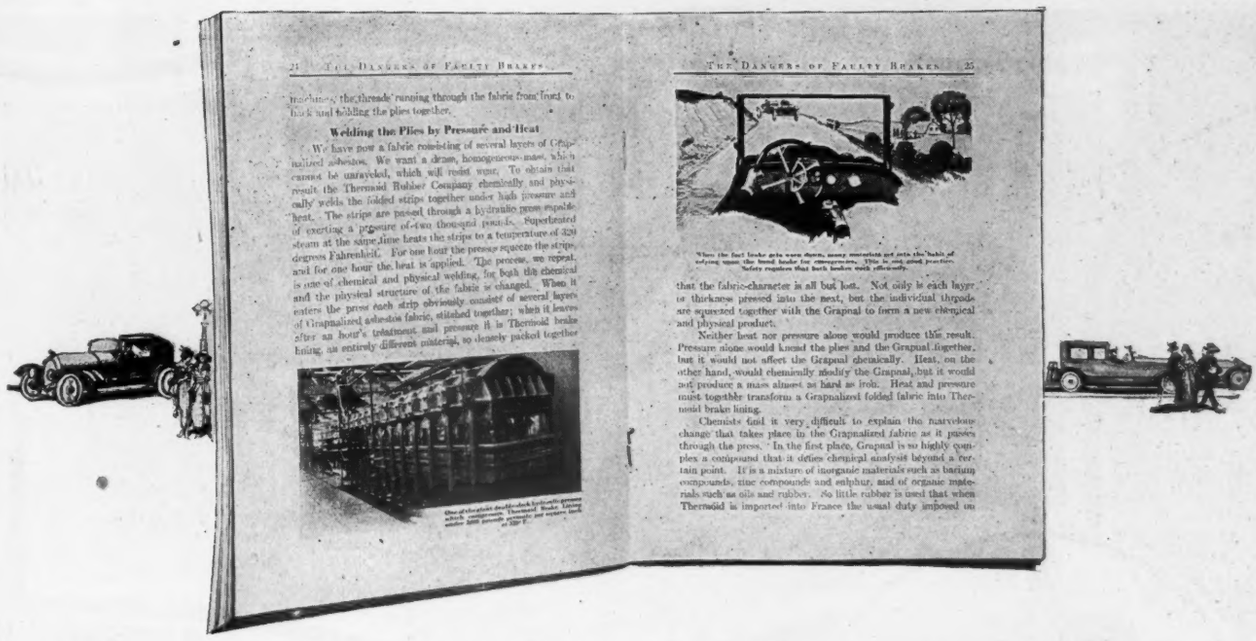
Made in three sizes: ⅛ in., ¼ in. and ⅛ in. diameter of body. Nickel Plated and Rough Steel finish. Self-closing and dust-proof.

Write for Catalog F

BOWEN PRODUCTS CORPORATION

Manufacturing and Sales Divisions
Auburn Div., Auburn, N. Y. Winkley Div., Detroit, Mich
Zerk Div., Cleveland, Ohio
Minneapolis Div., Minneapolis, Minn.

Branch Sales Offices
New York, 220 Broadway. Chicago, 1607 Otis Bldg.
San Francisco, Monadnock Bldg.
Boston, 903 Dexter Bldg. Cincinnati, 409 Lyric Bldg.



Welding the Plies by Pressure and Heat

We have now a fabric consisting of several layers of Grapnalized asbestos. We want a dense, homogeneous mass, which cannot be unraveled, which will resist wear. To obtain that result the Thermoid Rubber Company chemically and physically welds the folded strips together under high pressure and heat. The strips are passed through a hydraulic press capable of exerting a pressure of two thousand pounds. Superheated steam at the same time heats the strips to a temperature of 320 degrees Fahrenheit. For one hour the presses squeeze the strips, and for one hour the heat is applied. The process, we repeat, is one of chemical and physical welding, for both the chemical and the physical structure of the fabric is changed. When it enters the press each strip obviously consists of several layers of Grapnalized asbestos fabric, stitched together; when it leaves after an hour's treatment and pressure it is Thermoid brake lining, an entirely different material, so closely packed together that the fabric-character is all but lost. Not only is each layer so thickness pressed into the next, but the individual threads are squeezed together with the Grapnal to form a new chemical and physical product.

Neither heat nor pressure alone would produce this result. Pressure alone would knead the plies and the Grapnal together, but it would not affect the Grapnal chemically. Heat, on the other hand, would chemically modify the Grapnal, but it would not produce a mass almost as hard as iron. Heat and pressure must together transform a Grapnalized folded fabric into Thermoid brake lining.

Chemists find it very difficult to explain the marvelous change that takes place in the Grapnalized fabric as it passes through the press. In the first place, Grapnal is so highly complex a compound that it defies chemical analysis beyond a certain point. It is a mixture of inorganic materials such as barium compounds, zinc compounds and sulphur, and of organic materials such as oils and rubber. So little rubber is used that when Thermoid is imported into France the usual duty imposed on

The first complete book on brake lining ever published

Every dealer and garage owner should have this authoritative work

WHAT becomes of the energy when a car is stopped? How is the correct "co-efficient of friction" best determined? What is the most efficient method of adjusting the brakes on a car and keeping them in good condition? What are the essentials of a good brake lining?

Every dealer and garage man will find interesting and valuable data in the pages of this authoritative book—the first complete work ever published on the vital subject of brake lining.

In one year in Chicago 2,738 persons were struck by automobiles and trucks that could not stop in time. Facts, such as this, emphasize the indispensable need of a brake lining that can be depended upon in any emergency.

How to secure an efficient braking system—how Thermoid meets the exacting standards of dependable brake lining—is explained in this new book.

Tests that prove Thermoid's extraordinary wear resisting qualities—why it will not grab or slip and why its "co-efficient of friction" remains the same even when the brake lining is worn wafer thin—all these facts and more are included in this book.

More and more motorists are recognizing that Thermoid Brake Lining delivers the most in wear and hard service. To insure safe stopping they are insisting that their brakes be lined with Thermoid.

Specialize on Thermoid—the brake lining with *40% more material*—that is *"grapnalized"* and *hydraulic compressed*—that delivers the most in wear and safety, that adds to the good-will of your business.

Send for your copy of this important book today.

Thermoid Rubber Company

Factory and Main Offices: TRENTON, N. J.

New York Chicago San Francisco Detroit Cleveland Atlanta Philadelphia Pittsburgh Boston London Paris Turin

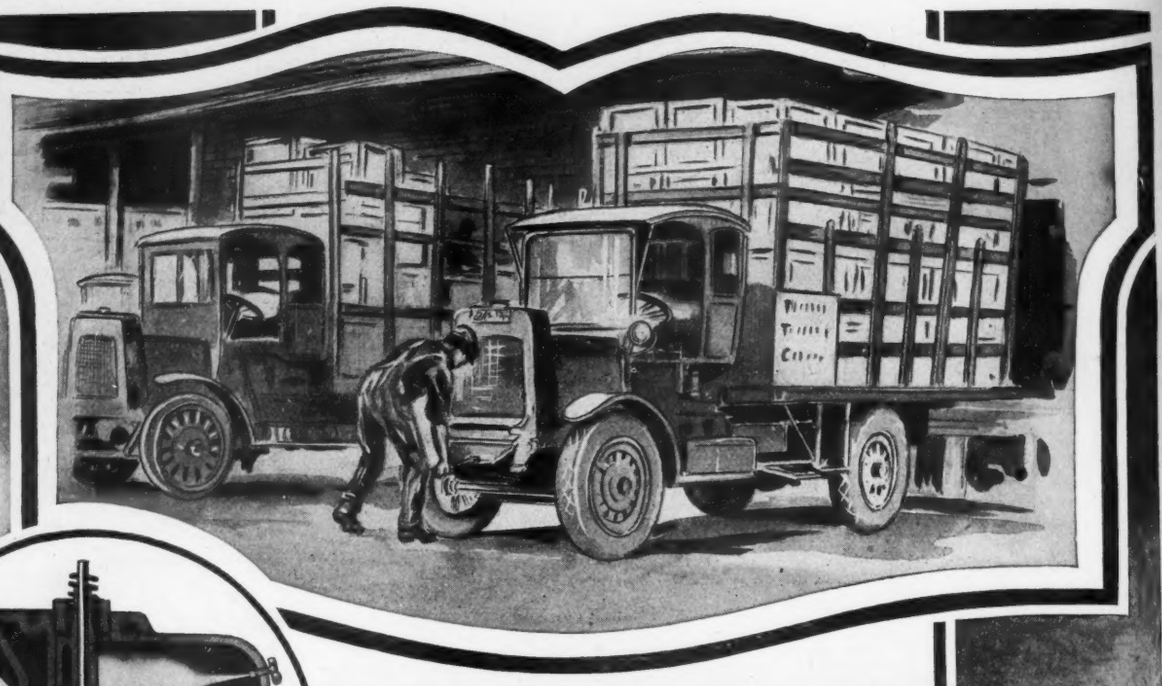
Canadian Distributors:

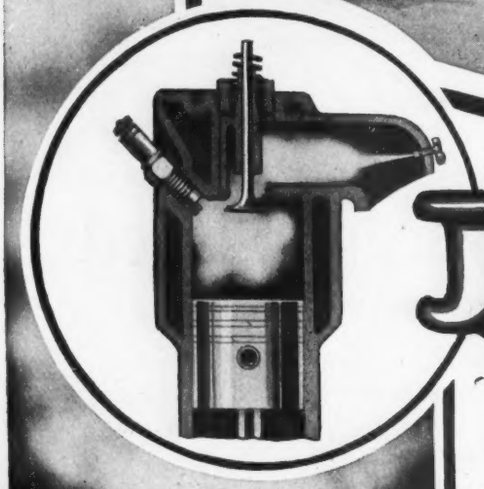
The Canadian Fairbanks-Morse Co., Limited, Montreal
Branches in all principal Canadian cities

Thermoid Brake Lining

Hydraulic Compressed

Makers of "Thermoid-Hardy Universal Joints" and "Thermoid Crolide Compound Tires"





JORGENSEN
VAPOR PRIMER

When Minutes Count

TO *pay,* motor trucks must ***move.*** Time lost in starting means money lost, schedules disrupted, delivery promises defaulted.

Equipped with the Jorgensen Vapor Primer a start is assured at the first or second quarter turn at any temperature or with any grade of fuel. Strictly mechanical in operation, this device is so simple that there is nothing to wear out or to cause trouble.

It performs its duty unfailingly and conserves time as well as preventing needless wear on the battery and starter. When the truck is not equipped with a starting system, it is doubly appreciated by the driver who must crank his motor for each start.

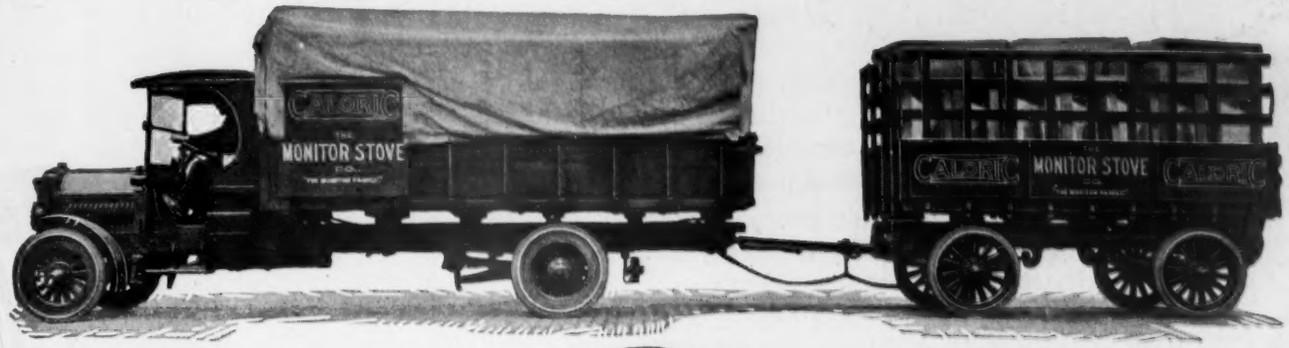
We suggest that you Jorgensen equip one of your trucks and by comparison see for yourself the saving in time and the elimination of trouble in starting which this device will effect.

We should like to mail you a booklet explaining the value of the Jorgensen Vapor Primer as an aid to economical truck operation.

We manufacture a complete line of high-grade machined brass motor fittings—Sediment Traps, Pet-Cocks, Priming Cups, etc.; also Motor Tappets.

The Jorgensen Mfg. Co.

Waupaca, Wisconsin



Power *for* Bad Hills *with a* Full Load *and a* Trailer!

THREE Schacht Trucks with ten-speed transmission—two of which pull Trailers—have made a remarkable record in the service of the Monitor Stove Company of Cincinnati.

Cincinnati is hilly and street conditions in some localities make great demands on a truck—particularly if it pulls a trailer.

But the eight different forward gear ratios provided by the Schacht transmission adapt the power of the motor to every requirement—whether for great power at low speed, or high vehicle speed at low engine speed.

The two 3½ ton trucks are equipped with removable bodies—three bodies for two trucks. One truck leaves the extra body at the plant and it is loaded before the other comes in. An extra trailer is loaded in the same way.

The greater speed at which the Schacht Trucks with ten-speed transmission enable a load to be taken through under all sorts of conditions, and the efficient modern way in which these trucks are used have resulted in a very low cost of operation.

Write for the facts about this remarkable truck.
It offers a tremendous dealer opportunity.

THE G. A. SCHACHT MOTOR TRUCK COMPANY

CINCINNATI, OHIO

BRANCHES: NEW YORK AND CHICAGO

Export Department, 237 Hancock Street, Long Island City.

Don't Sell Boomerang Springs

IN THE FINAL RECKONING of profits, the sale of "boomerang" springs, or the kind that come back with complaints, is like building your business on sand instead of rock.

To make sure that every spring replacement will breed satisfied patronage, sell the Harvey Guaranteed Spring.

The only "come-back" feature of the Harvey Spring is its resilience, its free and easy action that adds much to the comfort of the car.

The patented Harvey process of heat treating and tempering gives this spring remarkable strength and resilience without the danger of breakage or sagging..

Harvey Springs are made boltless and have no weak spots. They will bear up under the emergencies that break the ordinary spring.

The purchaser of Harvey Springs is protected by the broad Harvey guarantee. For the dealer this same guarantee acts as protection against complaints.

Harvey dealers' sales are made easier by this guarantee and the known quality of the Harvey Spring. Other selling aids are a part of our co-operative service to dealers. Send for the Harvey Book containing specifications for over 1500 kinds of springs, and other useful information.

HARVEY SPRING & FORGING CO.

105A 17th. St., RACINE, WIS.

McCORM
2 1 0
International
MOTOR TRUCKS
FOR LOW-COST HAULING
THERE ARE NINE SIZES OF INTERNATIONAL MOTOR TRUCKS: ¾ TO 3½ TON—BODY STYLES FOR EVERY BUSINESS
THE FURTHER YOU GET FROM ONE BRANCH HOUSE THE CLOSER YOU GET TO ANOTHER—THERE ARE 92 OF THEM IN THE U S A

International Motor Truck

service is available when needed but our service stations are never overcrowded, although Internationals are among the few leaders in all truck sales. A logical reason for this—and the true reason—is that International Motor Trucks are built to stay on the job.

Motor Truck Department

International Harvester Company of America

CHICAGO (Incorporated) U S A

Branch Houses, Distributors and Dealers Everywhere

HIGHWAY TRAILER

EDGERTON WISCONSIN

The Largest Trailer Plant in the World

The Public Service Company of Chicago cuts haulage costs 50% by the use of Highway Trailers

Sell the Trailer These Great Firms Choose

Many Bankers Now Stipulate the Use of Trailers in Financing Truck Sales

These Are a Few Large Operators of Highway Trailers

The U. S. Army ***The U. S. Navy***

Baldwin Locomotive Works
Philadelphia
American Telephone & Telegraph Company
The Cadillac Motor Car Company
Detroit
The National Tea Company
"Piggly-Wiggly" Chain Stores
Headquarters, Chicago
The Timroth Motor Express Company
Chicago
Southwestern Telephone & Telegraph Co.
St. Louis, Mo.
Towars Creamery Co.
Detroit
Chicago Telephone Company
The T. M. E. R. & L. Interurban Express Co.
Milwaukee, Minn.
The Fisher Body Co.
Detroit
The Rex Manufacturing Co.
Connersville, Ind.
The Public Service Company
Chicago
The Timken-Detroit Axle Co.
Detroit
Lindeteves-Stokvis Co.
Amsterdam, Holland
Dutch East Indies
Semarang-Soerabaya-Batavia
Tegal-Djokjakorta-Bandoeng
Medan-Makassar
T. E. M. A.
Buenos Aires-Shanghai

Every truck in your territory is a prospect for Highway Trailers.

The time is at hand when practically every truck sold, will sell one or more trailers.

Highway Trailers have established a dominant place in the scheme of modern transportation.

Thousands of truck operators now employ them who formerly bought trucks to meet their increased haulage needs. They add just as much hauling capacity as additional trucks. They require no added drivers. The operating cost is about 1 cent per ton mile as against 20 cents a ton mile for the average truck.

And Highway Trailers cost $1900 to $4000 less per unit than trucks.

The quality and construction of Highway Trailers is proved by the fact that they are the only trailers accepted without design change by the United States government, which operates more than $1,000,000 worth.

With such advantages you have the opportunity to build a big, profitable business. If you are interested in a franchise, write promptly.

The Highway Trailer Co., Edgerton, Wisconsin

When the Traffic Cop Says "Go"

That is but one of the many occasions when

Exide
BATTERIES

For Gas Truck Starting and Lighting

prove their real value. On solid tired trucks, where the terrific vibration soon ruins the ordinary kind, this efficient and dependable battery renders a long life of satisfactory service with a minimum of expense for repairs.

The Exide Truck Battery requires no special spring mounting to absorb the jolts and jars—it was built to withstand them. It was originally designed for Uncle Sam's Army Tanks—the roughest service in which storage batteries were ever used. It is the finished product of 32 years battery building experience.

Write and let us give you more detailed information.

THE ELECTRIC STORAGE BATTERY CO.

Oldest and largest manufacturers in the world of Storage Batteries for every purpose

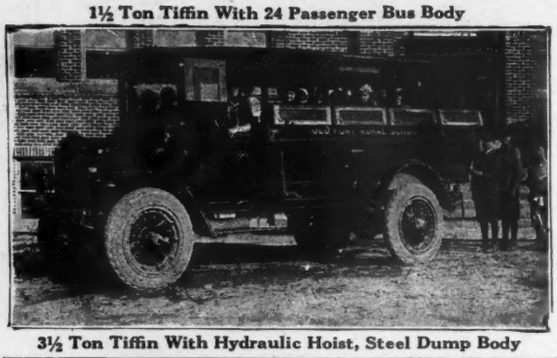
1888 PHILADELPHIA 1920

Branches in seventeen cities

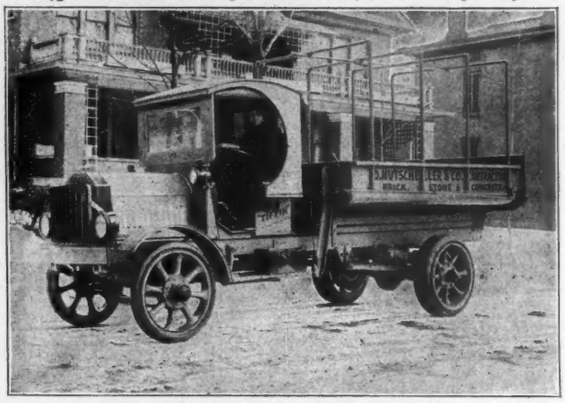
Special Canadian Representative: Chas. E. Goad Engineering Co., Limited
Toronto and Montreal

1½ Ton Tiffin With Trailer

1½ Ton Tiffin With 24 Passenger Bus Body



3½ Ton Tiffin With Hydraulic Hoist, Steel Dump Body



2½ Ton Tiffin With Extra Large Van Body

1200 Gallon Tiffin Street Flusher, 2 Motor System Type

TIFFIN
MOTOR TRUCKS
1½ TO 6 TON CAPACITIES

Who Buys Tiffin Trucks?

In every age and in every field there have been builders who have carried honest, trustworthy manufacture to such high standards that they were eagerly sought out.

Usually they were not the largest builders in their field, because breadth of operations and substantial quality have not always been synonymous.

Tiffin Motor Trucks fall under this classification.

Their makers have never and may never attain a phenomenally large output.

But each vehicle built does, and always will deliver a type of service that is keenly appreciated.

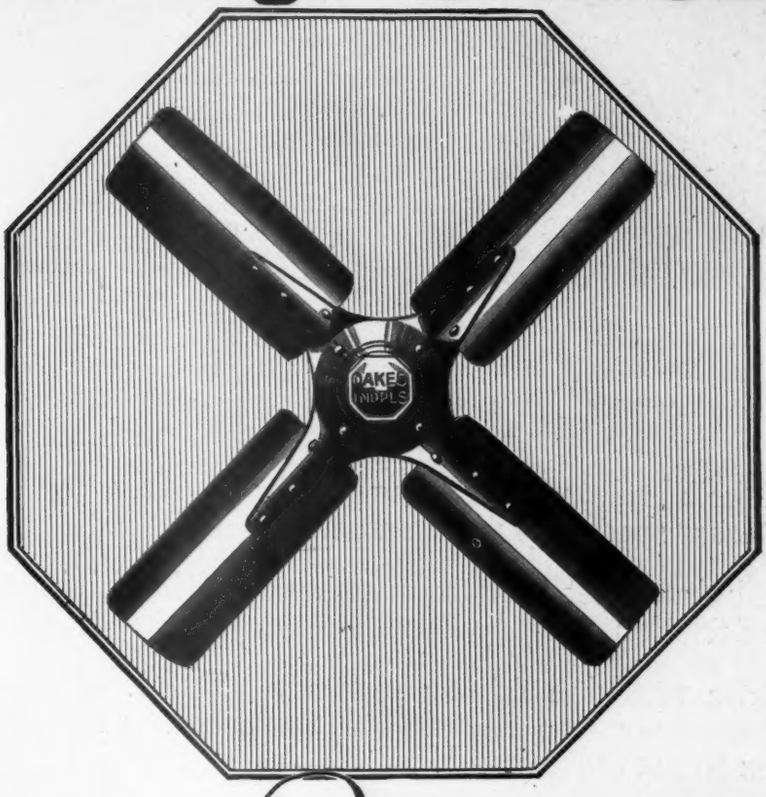
Those who value sterling merit are buying Tiffin Motor Trucks.

Information on Request

The Tiffin Wagon Company
Tiffin, Ohio

Efficient Cooling

Oakes Fans



Built by the foremost fan maker in America—chosen by most of the country's leading motor vehicle manufacturers, Oakes Fans are specifically designed to suit the engines they serve

The OAKES COMPANY
Indianapolis, U.S.A.

PACIFIC COAST REPRESENTATIVE: A. H. COATES CO.
41 SPEAR ST. SAN FRANCISCO

OAKES

The ten-acre plant of the New Process Gear Corporation

Gear Precision

The absolute interchangeability of New Process Gears speeds up your assembly.

Their correct tooth contours mean the minimum of friction.

The precision of the machine work is not disturbed by the heat-treatment which is so done as to prevent warping.

Our engineers are ready to show where it will pay you to take advantage of standardized New Process precision gears for which we are completely tooled.

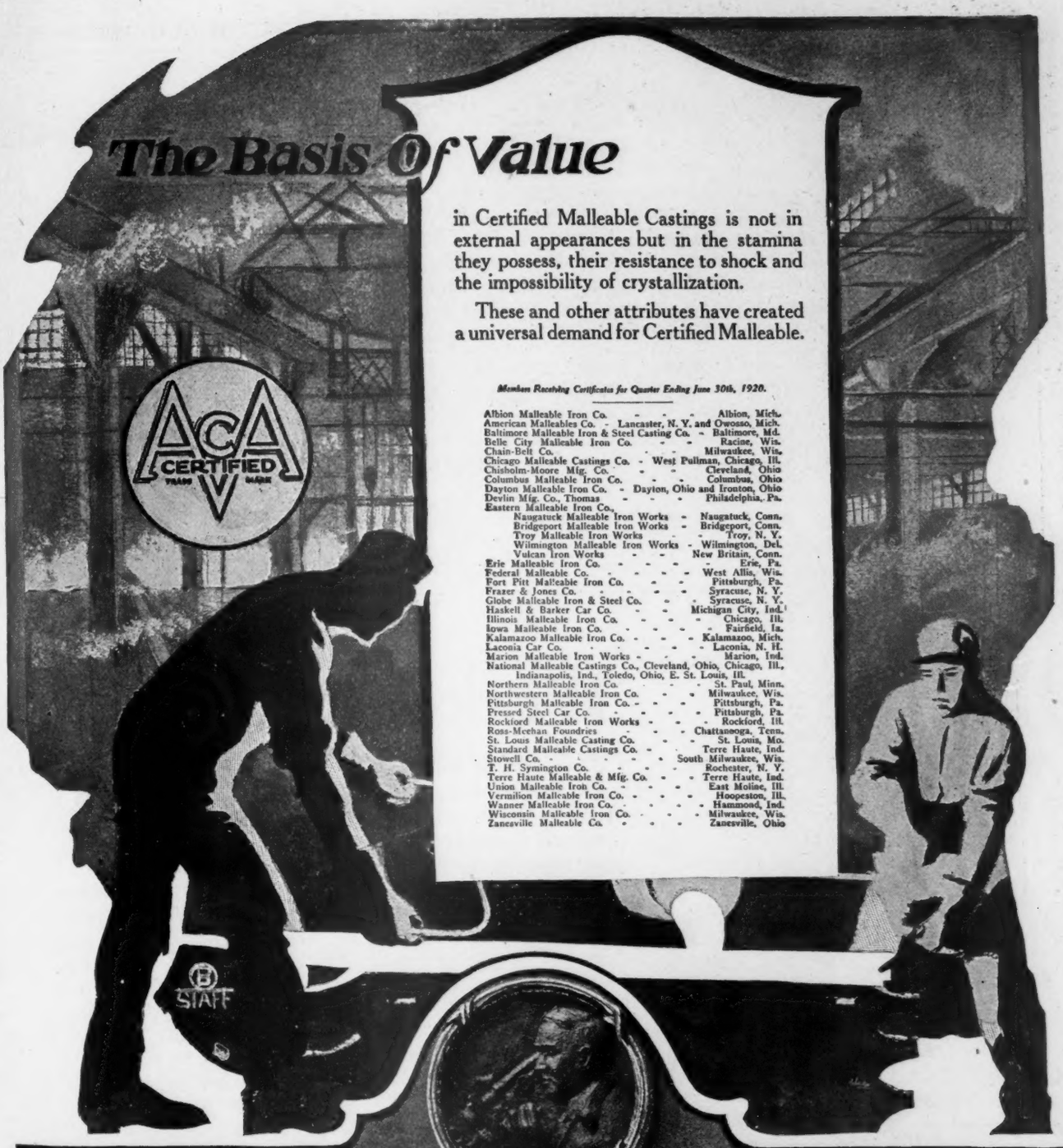
Quality — Quantity — Quickness

New Process Gear Corporation

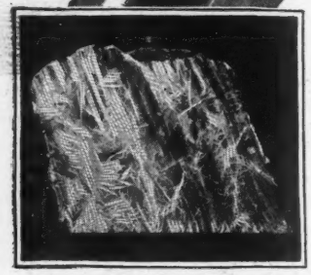
Syracuse *Member of the* **New York**

AGMA

New Process Gears


The Basis Of Value
in Certified Malleable Castings is not in external appearances but in the stamina they possess, their resistance to shock and the impossibility of crystallization.
These and other attributes have created a universal demand for Certified Malleable.
Members Receiving Certificates for Quarter Ending June 30th, 1920.
Albion Malleable Iron Co. - - - Albion, Mich.
American Malleables Co. - Lancaster, N. Y. and Owosso, Mich.
Baltimore Malleable Iron & Steel Casting Co. - Baltimore, Md.
Belle City Malleable Iron Co. - - Racine, Wis.
Chain-Belt Co. - - - Milwaukee, Wis.
Chicago Malleable Castings Co. - West Pullman, Chicago, Ill.
Chisholm-Moore Mfg. Co. - - Cleveland, Ohio
Columbus Malleable Iron Co. - - Columbus, Ohio
Dayton Malleable Iron Co. - Dayton, Ohio and Ironton, Ohio
Devlin Mfg. Co., Thomas - - - Philadelphia, Pa.
Eastern Malleable Iron Co.,
Naugatuck Malleable Iron Works - Naugatuck, Conn.
Bridgeport Malleable Iron Works - Bridgeport, Conn.
Troy Malleable Iron Works - Troy, N. Y.
Wilmington Malleable Iron Works - Wilmington, Del.
Vulcan Iron Works - - New Britain, Conn.
Erie Malleable Iron Co. - - - Erie, Pa.
Federal Malleable Co. - - - - West Allis, Wis.
Fort Pitt Malleable Iron Co. - - Pittsburgh, Pa.
Frazer & Jones Co. - - - Syracuse, N. Y.
Globe Malleable Iron & Steel Co. - - Syracuse, N. Y.
Haskell & Barker Car Co. - - Michigan City, Ind.
Illinois Malleable Iron Co. - - - Chicago, Ill.
Iowa Malleable Iron Co. - - - - Fairfield, Ia.
Kalamazoo Malleable Iron Co. - - - Kalamazoo, Mich.
Laconia Car Co. - - - - - Laconia, N. H.
Marion Malleable Iron Works - - - Marion, Ind.
National Malleable Castings Co., Cleveland, Ohio, Chicago, Ill., Indianapolis, Ind., Toledo, Ohio, E. St. Louis, Ill.
Northern Malleable Iron Co. - - - St. Paul, Minn.
Northwestern Malleable Iron Co. - - Milwaukee, Wis.
Pittsburgh Malleable Iron Co. - - Pittsburgh, Pa.
Pressed Steel Car Co. - - - - Pittsburgh, Pa.
Rockford Malleable Iron Works - - - Rockford, Ill.
Ross-Meehan Foundries - - - Chattanooga, Tenn.
St. Louis Malleable Casting Co. - - St. Louis, Mo.
Standard Malleable Castings Co. - Terre Haute, Ind.
Stowell Co. - - - - South Milwaukee, Wis.
T. H. Symington Co. - - - Rochester, N. Y.
Terre Haute Malleable & Mfg. Co. - - Terre Haute, Ind.
Union Malleable Iron Co. - - - East Moline, Ill.
Vermilion Malleable Iron Co. - - - Hoopeston, Ill.
Wanner Malleable Iron Co. - - - Hammond, Ind.
Wisconsin Malleable Iron Co. - - - Milwaukee, Wis.
Zanesville Malleable Co. - - - Zanesville, Ohio
ACA CERTIFIED
STAFF
CERTIFIED MALLEABLE-CASTINGS
THE AMERICAN MALLEABLE CASTINGS ASSOCIATION
ACA CERTIFIED
THE AMERICAN MALLEABLE CASTINGS ASSOCIATION
The 1900 Euclid Bldg.
CLEVELAND, OHIO
The Association solicits correspondence concerning any serious complaint users of Malleable Castings may have as to the quality of Malleable Iron furnished by any of the firms listed. Such complaints will be rigidly investigated.

Note the heavy, dense weave of Non-Burn, a unique, wear-resisting feature.



Asbestos Rock

Note the strong silken fibres. That is the distinction between the high grade rock from which Non-Burn is woven and the general run-of-mine fibre sold on the open market.

Woven Rock!

THINK of Johns-Manville Non-Burn Asbestos Brake Lining as woven rock. Blasted apart with dynamite, thousands of tons of asbestos rock are torn from Johns-Manville's mines and sent to their mills to be separated and graded.

Selecting the Rock for Non-Burn

Yet from these tons of fibrous rock, only a small percentage is selected in the grading process as being exactly suitable for brake lining. And this special asbestos, now a mass of strong, silky fibres, is shipped to the Johns-Manville factory to be spun and woven into Non-Burn Asbestos brake lining.

Spinning Rock Fibres

In the factory, specially designed machines spin the fibres of Asbestos rock into a strong, pliant yarn.

JOHNS-MANVILLE SERVICE COVERS THIS CONTINENT

Through—

Asbestos

and its allied products

JOHNS-MANVILLE
Serves in Conservation

Heat Insulations, High Temperature Cements, Asbestos Roofings, Packings, Brake Linings, Fire Prevention Products

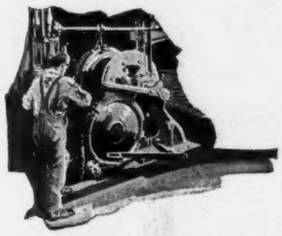
JOHNS — AUTOMOTIVE

Wearing Rock Yarn

This rock yarn, together with brass wire (except in the case of Non-Burn for Ford cars, where the brass wire is omitted) is woven into a narrow, heavy fabric, a fabric so strong and closely woven that it seems already, suitable for brake lining.

Impregnating Woven Rock

But before this fabric is ready to put on brakes, it is impregnated with a compound that gives it oil and water resisting qualities—not only on the surface, but through and through.



Johns-Manville furnished brake lining for such industrial machines as the above, when the automobile was but a blue-print fantasy.

Johns-Manville Non-Burn is Woven Rock

Non-Burn—woven asbestos rock—is the only brake lining mined, spun, woven and marketed by the same firm from start to finish. Think of the unified responsibility that stands back of every inch of it.

Advertising Non-Burn

You will recognize the outstretched arm, and the word "Brakes", so familiar to millions of people through their appearance in Johns-Manville national advertising. Day after day we tell your customers about Johns-Manville Non-Burn Asbestos brake lining and how it makes brakes last longer.

JOHNS-MANVILLE CO.
Madison Avenue at 41st Street, New York City
10 Factories—Branches in 64 Large Cities
For Canada
CANADIAN JOHNS-MANVILLE CO., Ltd.
Toronto

Selling Non-Burn

Non-Burn asbestos brake lining is most readily saleable, because of the consumer demand Johns-Manville national advertising has built for it.

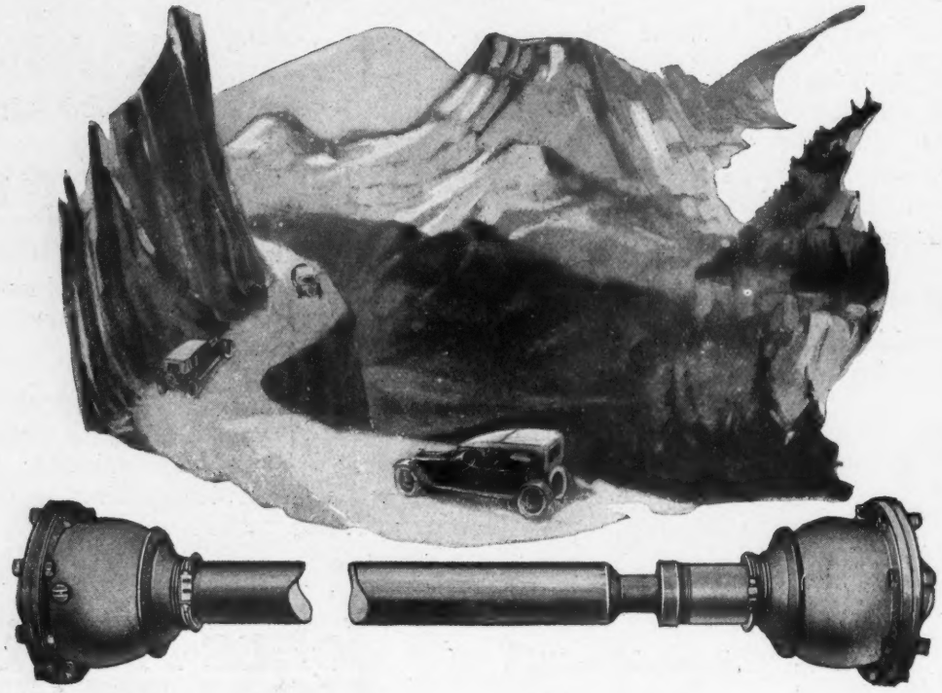
Moreover your sales are aided and your profits protected through the Johns-Manville policy. Ask a Johns-Manville Distributor about it.

Or ask any Johns-Manville branch to tell you about the opportunities for dealers in the sale of Non-Burn asbestos brake lining—the brake lining that is woven from asbestos rock.

Johns-Manville NON-BURN Asbestos Brake Lining

Brakes are safer and last longer with Non-Burn

MANVILLE EQUIPMENT

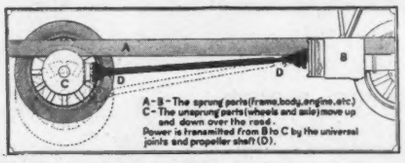


Who ever heard of a SPICER equipped vehicle that was out of service because of the failure of its driving unit?

SPICER MANUFACTURING CORPORATION—SOUTH PLAINFIELD, N.J.

Spicer

UNIVERSAL JOINTS AND PROPELLER SHAFTS


A
B
C
D
D
A-B-The sprung parts (frame, body, engine, etc.)
C-The unsprung parts (wheels and axle) move up and down over the road.
Power is transmitted from B to C by the universal joints and propeller shaft (D).

Write on your business letterhead for booklet concerning Spicer Universal Joints and Propeller Shafts

The Chain Drive *and* Depreciation

"During the past eight years my old Mack has been out of service for repairs less than five days. Last winter it ran continuously without a lay-up."—*From one letter of hundreds we should like you to read.*

GOVERNMENT tests have shown that a 5½-ton chain driven truck has only 68% of the road impact of a 3½-ton model, enclosed-gear driven type.

This great difference of unsprung weight in favor of the chain drive together with *flat* springs of ample dimensions are important factors in maintaining the low depreciation ratio characteristic of Mack trucks.

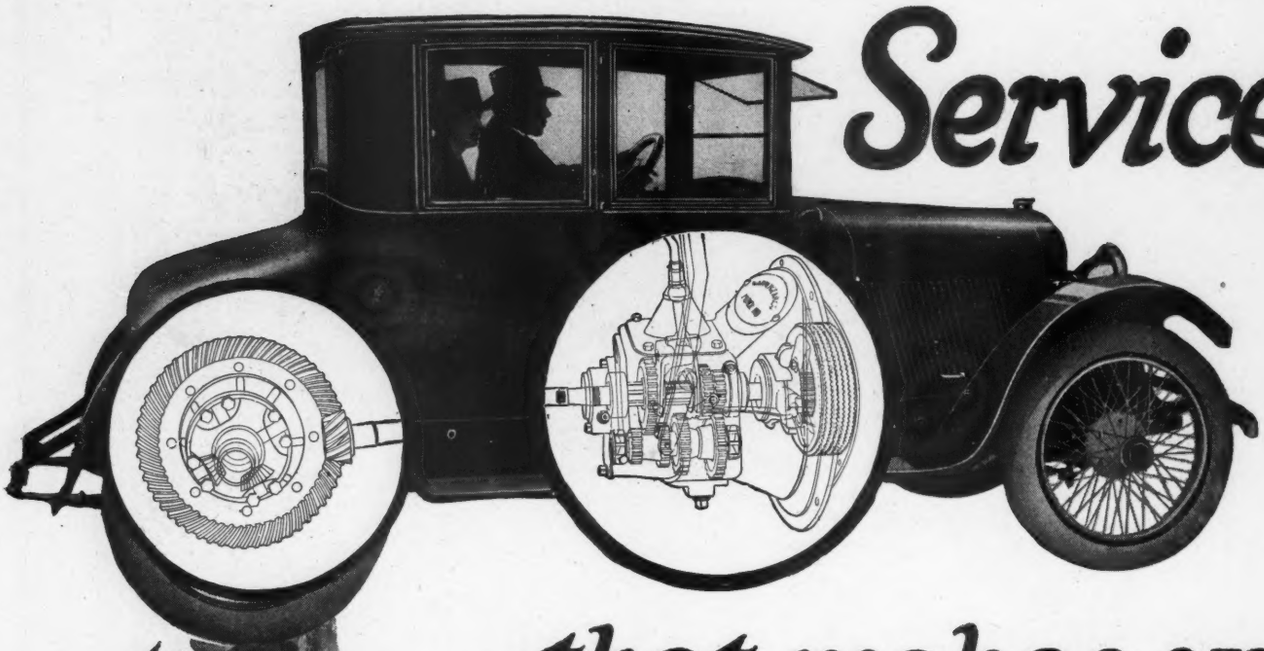
Distinctive Mack engineering features, combined with 18 basic Mack patents have developed the motor truck the world is talking about.

Capacities 1½ to 7½ tons. Tractors to 15 tons

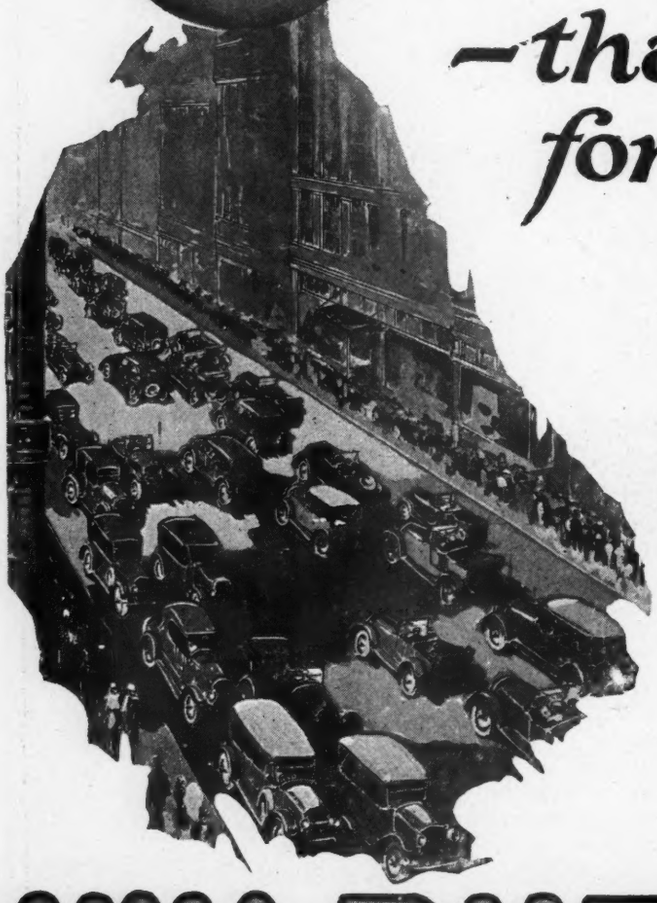
Our latest catalogues, Nos. 13 and 39, contain a detailed description of the many exclusive features that have made Mack supremacy possible, together with the complete specifications of every model. Send for them today.

INTERNATIONAL MOTOR COMPANY, NEW YORK

"PERFORMANCE COUNTS"



Service-



—that makes you forget its source

SO perfectly and quietly do Warner Gear parts transmit the motor's power, that the driver knows only the service they render—the parts themselves are forgotten.

The absence of complaints, the ofttimes lack of knowledge that these very essential moving parts are actually there, is the unspoken praise that amply rewards us for the perfection toward which men, materials and machines are giving their best—the silent testimonial to the buying judgment of the motor car manufacturer who uses Warner Gear parts.

WARNER GEAR COMPANY

MUNCIE INDIANA

Proven by Experience

Facts proven by *experience* convey the greatest significance to both dealers and users.

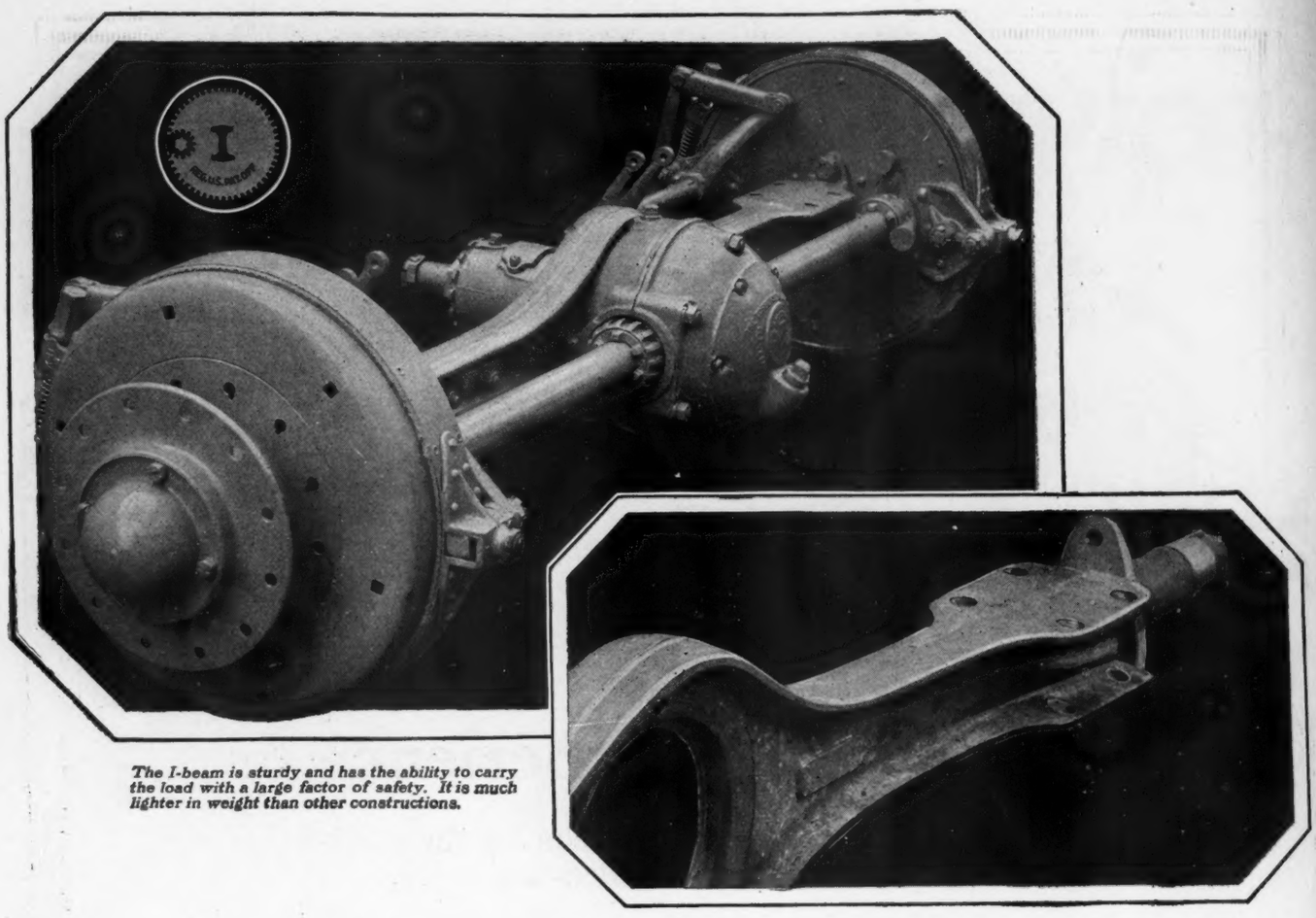
An experience of over forty years in studying road requirements throughout the world and in producing road vehicles of quality, economy and endurance reflects itself in the maximum performance Old Hickory Trucks are rendering.

There is an unusual satisfaction in selling and operating Old Hickory, not only because of its ability to make good through all contingencies but also because of the knowledge that an organization of permanence, dependability and *experience* stands back of it.

Write for particulars

Kentucky Wagon Manufacturing Co.
Incorporated
Louisville, Kentucky

"OLD HICKORY"



The I-beam is sturdy and has the ability to carry the load with a large factor of safety. It is much lighter in weight than other constructions.

The fact that the Torbensen Axle is particularly adapted to the speed wagon, goes right back to the Torbensen internal gear principles. The patented I-beam construction means exceptionally light weight, with resultant operating economy. Unusually high road clearance is a great advantage, especially on the farm. Thousands of owners of Torbensen-driven speed wagons will testify to the uniformly good work done by their trucks.

TORBENSEN AXLES

CLEVELAND, OHIO

Pulling Power of PIERCE-ARROW 2-ton, 3½-ton, 5-ton Dual Valve Trucks

Dual Valves produce much greater power, surprising economy of operation and surpassing performance.

Increased valve area facilitates intake and exhaust of gas. Double ignition assures complete combustion—delivering *the full explosive power, saving gasoline* and increasing efficiency.

Other advantages produced, without sacrifice of durability, long life or continuous operation, include accessibility to quick repairs and easy operation—both saving time and reducing labor costs.

Pierce Arrow

48 of the FIRST FIFTY trucks still running after 9 years' service.

Delivers more work in a given time.

Loses less time on the job and off the job.

Costs less to operate and less to maintain.

Lasts longer, depreciates less, commands a higher resale price.

THE PIERCE-ARROW MOTOR CAR COMPANY, BUFFALO, N. Y.

PERFECTION
SPRINGS

Engineers of The Perfection Spring Company have for many years specialized in developing spring suspensions that satisfy precisely the load and road conditions of the motor vehicle served.

Their recommendations are based upon the exceptionally broad and successful experience gained in designing the majority of springs now being used on passenger cars and trucks.

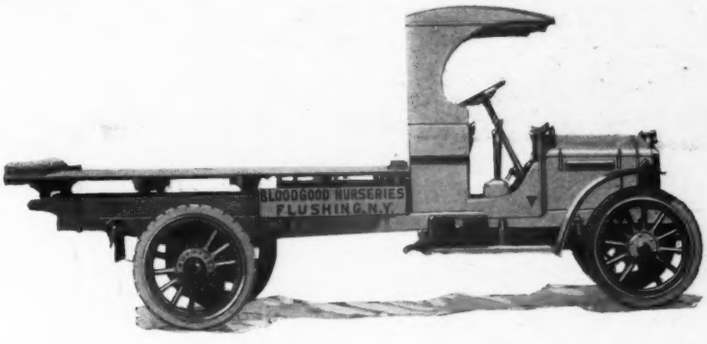
THE PERFECTION SPRING COMPANY, CLEVELAND, OHIO
THE SPRING DIVISION OF THE STANDARD PARTS COMPANY
OTHER DIVISIONS ARE: THE EATON AXLE COMPANY, THE BOCK BEARING COMPANY, THE STANDARD WELDING COMPANY

THESE MANUFACTURERS EQUIP ALL OR PART OF THEIR PRODUCTS WITH PERFECTION SPRINGS

Abbott-Downing Truck & Body Co.
Adams-Barre Company
All American Truck Company
American Steel & Wire Co.
American Tractor Corp'n
Anderson Motor Co.
Apperson Bros. Auto Co.
Arcadia Trailer Corp'n
Australian Motors Co. Ltd.
Auto Kamp Equipment Co.
Bacon Motors Company
Barley Motor Car Company
Bartholomew Co.
Bessemer Motor Truck Co.
C. L. Best Traction Co.
J. T. Boone
Briscoe & Stahl Motor Corporation
Brown City Mfg. Company
Buffalo Truck & Tractor Co.
H. G. Burford & Co., Ltd.
Cadillac Motor Car Co.
Carroll Motor Car Co.
Chandler Motor Car Co.
Chevrolet Motors Co.
Cleveland Tractor Company
Cleveland Trailer Mfg. Co.
Clydesdale Motor Truck Co.
Cole Motor Car Co.
Columbia Motor Truck & Trailer Co.
Commodore Motor Corp'n
Cook Motors Corp'n
Crock Motor Car Company
Crow-Elkhart Motor Corp'n
Daniels Motor Car Co.
Dart Truck & Tractor Co.
Defiance Motor Truck Co.
Dependable Truck & Tractor Co.
Dort Motor Car Co.
Dunham Company
Elkhart Carriage & M. C. Co.
Elwell Parker Elec. Co.
Erie Motor Truck Mfg. Co.
Essex Motors Company
Fergus Motors, Inc.
Ford Motor Company
Fremont Motor Car Co.
Fruehauf Trailer Co.
Fulton Motor Truck Co.
Garford Motor Truck Co.
Gramm-Bernstein Motor Truck Co.
Grant Motor Car Corp'n
Hal Fur Motor Truck Co.
Halladay Motor Corp'n
Hamlin-Holmes Motor Company
Harrisburg Mfg. & Boiler Co.
Harvard Motor Car Co.
Highway Trailer Co.
Hi-Speed Trailer-car Co.
Holmes Automobile Co.
Hudson Motor Car Co.
Huffman Bros.
International Purchasing & Eng. Co.
Jackson Motor Corp'n
Jordan Motor Car Company
Kelly-Springfield Motor Truck Co.
Kentucky Wagon Mfg. Co.
Kenworthy Motors Corp'n
Kline Cars Company
Kurtz Motor Car Co.
LaFayette Motors Co.
Leach-Biltwell Motor Car Company
Lewis-Hall Motors Corp'n
Lexington Motor Co.
Maibohm Motor Co.
Marsh Motors Company
Maxwell Motor Company, Inc.
McFarlan Motor Co.
Mercer Motors Co.
Meteor Motor Car Co.
Metz Company
Miami Trailer Co.
Miles Mfg. Company
A. J. Miller & Co.
Moller Motor Co.
Monitor Motor Car Co.
Nelson Motor Truck Co.
New England Truck Co.
Noma Motors Corp'n
Northway Motors Corp'n
Norwalk Motor Car Company
Ohio Motor Vehicle Co.
Olds Motor Works
Owen Magnetic Motor Car Corp'n
Paige-Detroit Motor Car Co.
Pan Motors Company
Paragon Motor Car Company
H. W. Peabody Co.
Piedmont Motor Car Co.
Premier Motor Corp'n
Rail Welding & Bonding Co.
Rainier Motor Corp'n
Regal Motor Car Co.
Reynolds Motor Truck Co.
Robertson Cole Company
Sayers & Scovill Company
Seagrave Company
Selden Truck Corp'n
Severin Motor Co.
E. M. Sheehan
Signal Motor Truck Co.
Skelton Motors Corp'n
Southern Motor Mfg. Ass'n
Standard Motor Truck Co.
Stanwood Motor Car Co.
F. B. Stearns Co.
Templar Motors Corp'n
Towmotor Co.
Trailmobile Company
Troy Wagon Works Co.
Tulsa Auto Manufacturing Company
Twin City M. T. Co.
Union Trailer Works
United Motors Company
U. S. Tractor & Machinery Co.
Walker Johnson Truck Co.
Walter Motor Truck Co.
White Motor Company
J. C. Wilson Company
Winton Co.
Yellow Taxicab Co.

HURLBURT

A Conservative Truck



Hurlburt Truck Operated Since 1914 by Bloodgood Nurseries, Flushing, New York

"The winter of 1914 I purchased of you a 1½ ton Hurlburt car and have operated the car continuously since. After covering over 100,000 miles the car renders the same uninterrupted service and is a source of pride to ourselves and wonder to others. Upkeep cost is astonishingly low."

THE Hurlburt Truck looks to be just what it is—a sturdy, well-planned, honestly built piece of machinery. It is thoroughly representative of the people who manufacture it.

There is no part or principle in the Hurlburt Truck which has not been thoroughly proved.

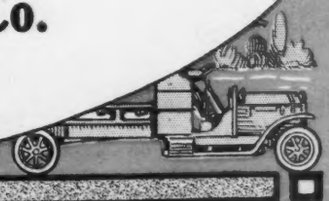
There are no thrilling stunts in Hurlburt performance—but there is the ability to do regularly for many years any work a truck can be expected to do.

The Hurlburt is a good truck, built by men who believe that such a policy will earn for them a larger share of the truck business.

Merchants who have sold motor cars on this basis are invited to write us.

Harrisburg Manufacturing & Boiler Co.

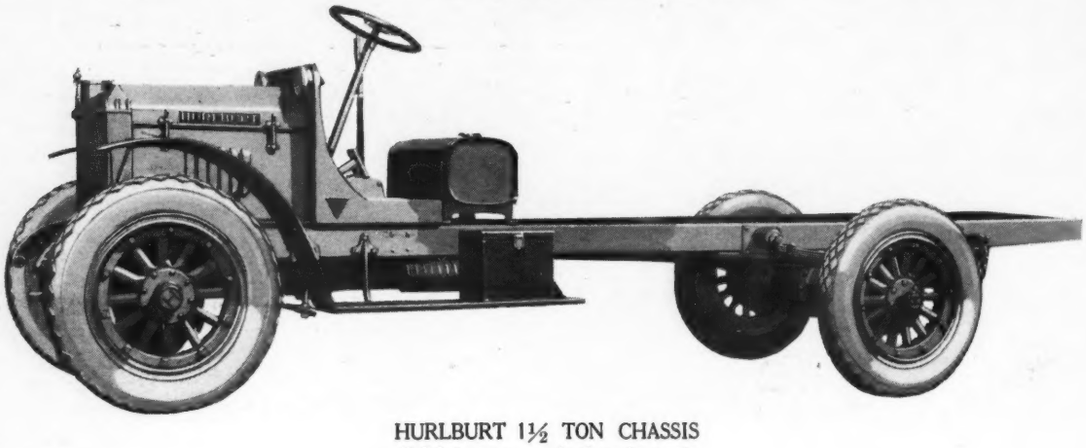
Harrisburg, Pa.



(OVER)

HURLBURT

A Conservative Truck



HURLBURT 1½ TON CHASSIS
(Solid tires are standard equipment)
Also made in 2½, 3½ and 5 ton sizes

THE Hurlburt Truck is distinguished for its massive construction. The factor of safety in the frame, axles, springs, power plant, and driving parts is higher than in any other truck made.

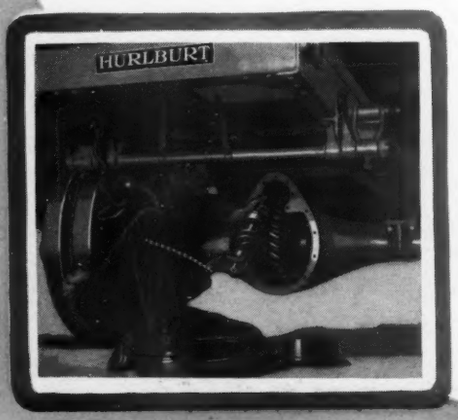
All parts are readily accessible without disturbing others. No time is lost in getting at the motor, transmission or rear axle.

The motor is a Buda, four-cylinder, with detachable head and full force feed lubricated. The crankshaft is drop-forged from highest grade open-hearth steel and has a tensile strength of 120,000 pounds per square inch. The power is transmitted in a straight line from engine to rear axle.

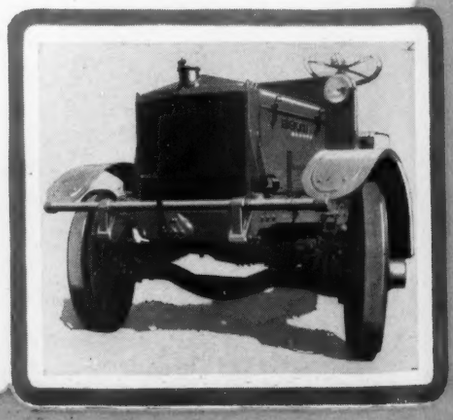
The Hurlburt Truck is absolutely standardized. It is manufactured from standardized materials, and parts of all models can always be obtained.

The first Hurlburt Trucks were manufactured nine years ago and are still doing their daily work in the heavy trucking centers of eastern United States and in seventeen foreign countries.

1—Worm-drive rear axle, full floating.
2—Worm and worm wheel removable from rear of housing without use of jack or disturbing body.



1—Sturdy radiator with spring mounting.
2—Heavy bumper, triple bolted to fenders.
3—Over-sized, drop-forged front axle.



Harrisburg Manufacturing & Boiler Co.
Harrisburg, Pa.

(OVER)

The LYCOMING MOTOR

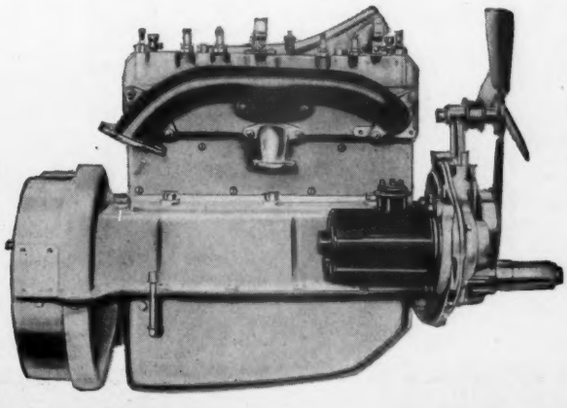
LYCOMING MOTORS CORPORATION

Why the Engineer Favors the Guaranteed Lycoming

The engineer looks for mechanical perfection, smooth performance and durability in the motor he selects. The sales manager convinces himself that the motor will stand the strain but he is primarily interested in its selling features. The engineer penetrates more deeply into the construction. He finds throughout the Lycoming an unparalleled attention to details. His examination reveals that each feature of construction has received the conscientious attention of specialized experts and the rigid scrutiny of capable inspectors. He views its perfect mechanism with the same admiration as a master time-piece maker would exhibit on beholding a perfect watch, flawless in every detail.

When he learns that each Lycoming Motor is tested for hours on the block, under its own power, before shipment, he knows he can safely place his official recommendation beside the Sales Manager's. That his confidence is justified is proven by thousands of Lycoming Motors that still perform today, after years of constant service, when ordinary motors have long since been abandoned.

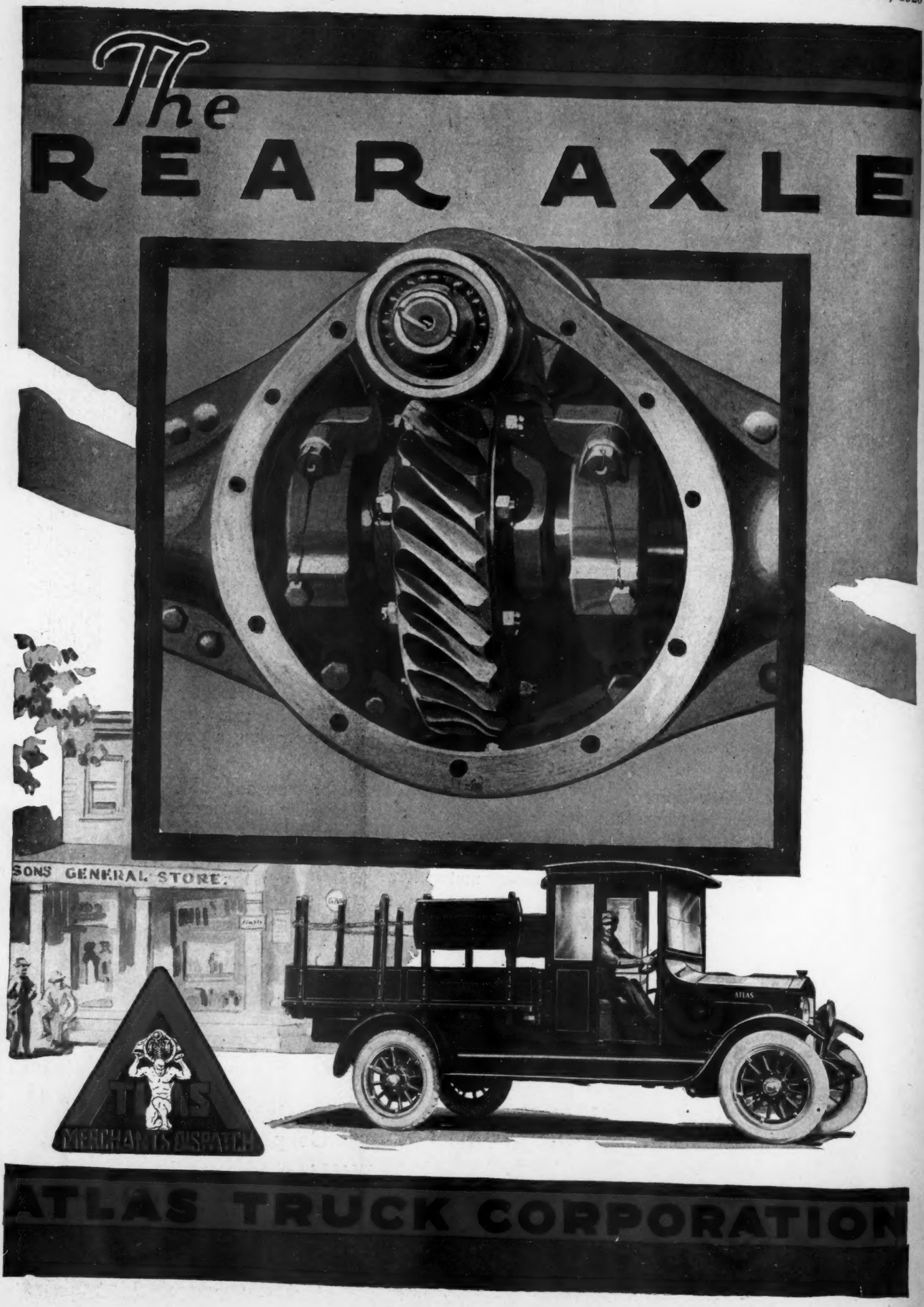
He knows, furthermore, that no manufacturer would place an uncompromising and unescapable guarantee on a motor that was not mechanically perfect.



These are the reasons why most engineers approve the Lycoming Motor.

Lycoming Motors Corporation

Williamsport, Pa.


The
REAR AXLE
SONS GENERAL STORE
ATLAS
MERCHANTS DISPATCH
ATLAS TRUCK CORPORATION

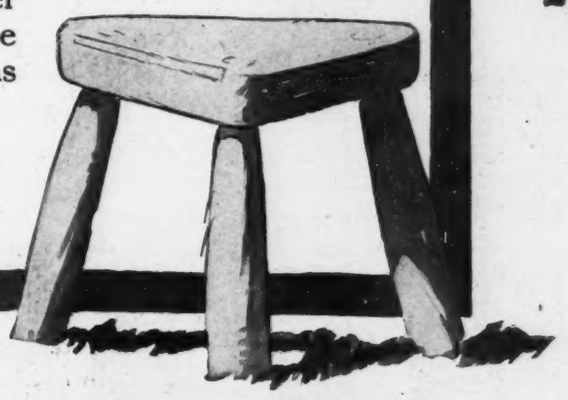
and the MILKING STOOL

HAVE *you* crept forth from bed at dawn and "so-bossed" a refractory cow all around the barnyard? Then you don't need a professor to tell you that "three points determine a plane." No matter how rough the ground, the old three-legged stool would stand.

That's why the Atlas Worm-Drive has three points—three fixed points that make it foolproof. It can't get out of adjustment. It won't allow friction to burn up a lot of power. It renders the rear axle always efficient.

This is only one of the many features that make the "Merchants' Dispatch" as sturdy as it is light. Ask your dealer or us to explain the three major links in the Atlas chain of excellence.

Individual Body Equipment for Every Business



ATLAS WORM-DRIVE "MERCHANTS' DISPATCH"

YORK, PENNSYLVANIA

MULTIBESTOS
BRAKE LINING

is factory equipment on the following trucks, tractors and axles:

TRUCKS
Acason
Ace
Acme
All-Power
AmericanLaFrance
Armleder
Atco
Atterbury
Available
Beaver
Brockway
Buffalo
Capitol
Clydesdale
Collier
Concord
Conestoga
Day-Elder
Dearborn
Dependable
Detroit
Diamond T
Dodge Bros.
Dorris
Dort
Fageol
Federal
Ford
Gabriel
Garford
G-M-C
Giant
H. R. L.
Hahn
Hall
Hendrickson
Hewitt-Ludlow
Huffman
Independent
Jackson
Kalamazoo
Kelly-Springfield
Kissel Freighter
Kleiber
Lippard-Stewart
Luedinghaus
Maccar
Mack
Master
Maxwell
Menges
Menominee
Mutual
National
Netco
Norwalk
O-K
Oneida
Packard
Parker
Patroit
Pierce-Arrow
Rainier
Selden
Seneca
Service
Signal
Standard
Standard Oil Company of Ohio
Sterling
Studebaker
Sullivan
Super
Texan
Tiffin
Tower
Twin City
Velie
Watson
Wilcox Trux

TRACTORS
Avery
Bailor
Boring
Chase
Dauch
Emerson-Brantingham
G-O
Hart-Parr
Illinois Super Drive
Indiana
Liberty
Massey-Harris
Moline-Universal
Monarch
National
Parrett
Samson
Waterloo Boy

AXLES
Peru
Salisbury
Spacke
Standard
Timken-Detroit
Wisconsin

MOTORCYCLES
Excelsior
Harley-Davidson

MULTIBESTOS is also used as factory equipment on the leading American passenger cars.

Through the Eyes of Truck Engineers

TRUCK engineers *know* brake lining. They study—analyze—compare it. They test it with relentless severity, for they know the importance of *good truck brakes.*

America's foremost truck engineers have registered an overwhelming preference for Multibestos (see the Multibestos factory equipment list at left). They have found that Multibestos—with its famous Interlocking Weave, long-fibred asbestos and sturdy wire strands—gives long wear and dependable service always.

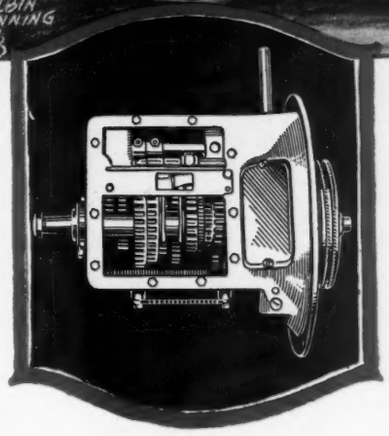
Could proof be more *convincing?* Look at brake lining through the eyes of truck engineers. Base *your* choice on *their* knowledge. For safety, long wear and dependable brake service, *reline only with Multibestos.*

Send for valuable free booklet, "The Care of Your Brakes"

MULTIBESTOS COMPANY, Walpole, Mass., U. S. A.

CHICAGO, 1430 Michigan Ave.
SAN FRANCISCO, 1035 Polk St.
KANSAS CITY, 3104 Tracy Ave.
CHATTANOOGA, 8th & Broad Sts.
NEW YORK, 105 W. 63rd St. (West of Broadway

MULTIBESTOS
BRAKE LINING



Master Clutch and Transmission

The heat-treating of the steels used in the Master Transmission are the best known to the steel industry. The gears are machined to one-half of one-one-thousandth of an inch and twice inspected and checked. They are made for Master Trucks by the largest and best known concerns of their kind in the world, and every part is stronger than necessary—"balanced oversize."

balanced oversize

makes Master Trucks masters in the Oil Industry

NO overloading with a tank body! That's why dealers like to sell trucks for this use. But it's an additional source of satisfaction to Master dealers to know that balanced oversize makes the Master more than the master of its load of oil on any road or hill.

The same poised strength that makes the Master the truck for the hardest hauling is in this tank-topped chassis—ready for the emergency that would bring most trucks back for service.

The Master's balanced oversize is *profit insurance* for dealer and owner—no matter what the task—no matter what the industry. It is the built-in guarantee of a good truck investment.

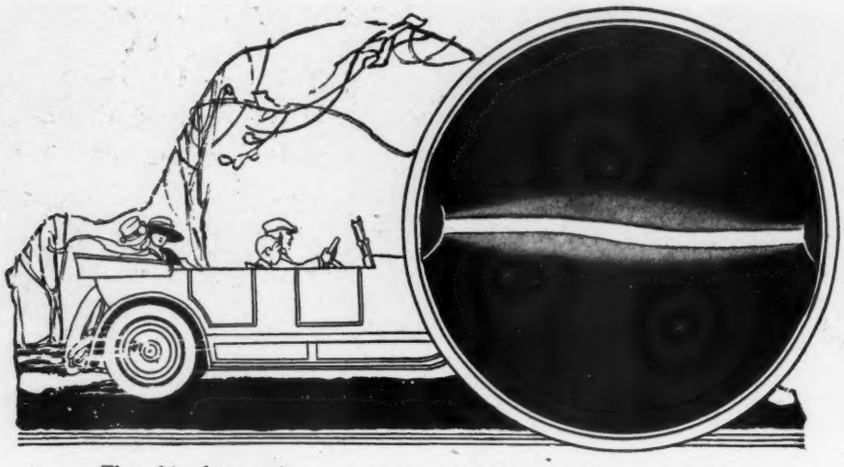
14 Master Models—1½ to 6 Tons.

Good Dealers Are Invited to Write or Wire

MASTER TRUCKS, Inc.
Chicago, Illinois

MASTER TRUCKS

MASTER OF THE LOAD ON ANY ROAD



The white hot spark you want when you want it—and every time!

You don't have to be an electrical engineer to know what a "mag" does—

Sparks

16. *Do you have to "be sure to use distilled water" with a "mag"?*
No, there's no water at all.

17. *Do you ever test "specific gravity" with a "mag"?*
Never.

18. *Do you ever "drain electrolyte" from a "mag"?*
No, it hasn't any.

19. *Do you have to "remember to switch off the current" with a "mag"?*
No. It stops automatically.

20. *What do you do to a "mag"?*
Give it a few drops of oil every 1000 miles or so and forget it.

(To be continued)

And it's what a "mag" *does* that's important—

A "mag" delivers white hot "juice" all-day-every-day, up or down hill, high or low speed, Winter or Summer.

On trucks, on tractors, marine engines, stationary engines—in fact on nearly all gas engines that have to earn their keep, you'll find a "mag."

Ignition is the *heart* of your engine—

So you want ignition that *won't* lie down.

The simplest, the most economical, the absolutely dependable form of ignition—

And that's an Eisemann "mag."

THE EISEMANN MAGNETO CORPORATION
32 Thirty-Third Street, Brooklyn, N. Y.

Detroit:
85 Willis Avenue, W.

Chicago:
1469 So. Michigan Avenue

© 1920 E. M. C.

91% More Pulling Power
36% More Road Speed

—and greatly decreased gasoline consumption.

The secret is in the gear box of the Fageol—*the truck with the compound transmission* (patents pending).

Present and future transportation problems will be solved by motor trucks having a wider range of power and speed combined with greater operating economy.

Fageol Trucks will be marketed through a limited number of high grade dealers. Your territory may still be open.

Two Models—Medium and Heavy Duty.

FAGEOL MOTORS COMPANY [OF OHIO], CLEVELAND, O.
FAGEOL MOTORS COMPANY. OAKLAND, CAL.

FAGEOL COMPOUND TRUCKS

TRAYLOR

THE manufacturing prestige of the Traylor organization has, in twenty years, accumulated an international recognition of first rank.

That is why the Traylor dealer franchise and Traylor guarantee represent a coat-armor of worth to dealers and owners of Traylor motor trucks and farm tractors.

Traylor Engineering and Manufacturing Co.

Allentown and Cornwells, Pa.

"Products of an Old Organization"

Some Territory Open to Responsible Dealers

Allentown *New York* *Chicago* *Pittsburgh* *Los Angeles* *Spokane*

MOTOR TRUCKS & FARM TRACTORS

Working hand in hand with pneumatics
Big lumbering trucks with enormous pneumatic tires are becoming familiar sights on every road.
WOOD Wheels afford an additional shock absorbing feature. They pick up the shocks and vibrations that are not taken up by the pneumatics.
Wheel bearings, axles and differential are protected by the shock absorbing qualities of WOOD Wheels from vibrations, which if transmitted with undiminished force, would work havoc with these unsprung parts.
This is another reason why WOOD Wheels have been used for years and will continue to be used on the world's best trucks.
AUTOMOTIVE WOOD WHEEL MANUFACTURERS' ASSOCIATION
105 West Monroe Street Chicago, Ill.
NOTE THE WOOD WHEELS EVERYWHERE
WOOD WHEELS for MOTOR VEHICLES

Transport's New Oiling System

Another Big Selling Point

FROM their beginning Transport Trucks have led in such important points as perfected governing, reduction of friction, and the addition of miles per gallon by more thorough combustion.

The new Transport lubrication system—a product of Transport engineering exclusively—marks another decided advance in construction. Transport oiling, and the Alemite high pressure system, which positively forces grease just where it belongs, automatically take care of the lubrication of all Transport models. There is not a grease cup on any Transport.

Such features explain why Transports are winning the market everywhere.

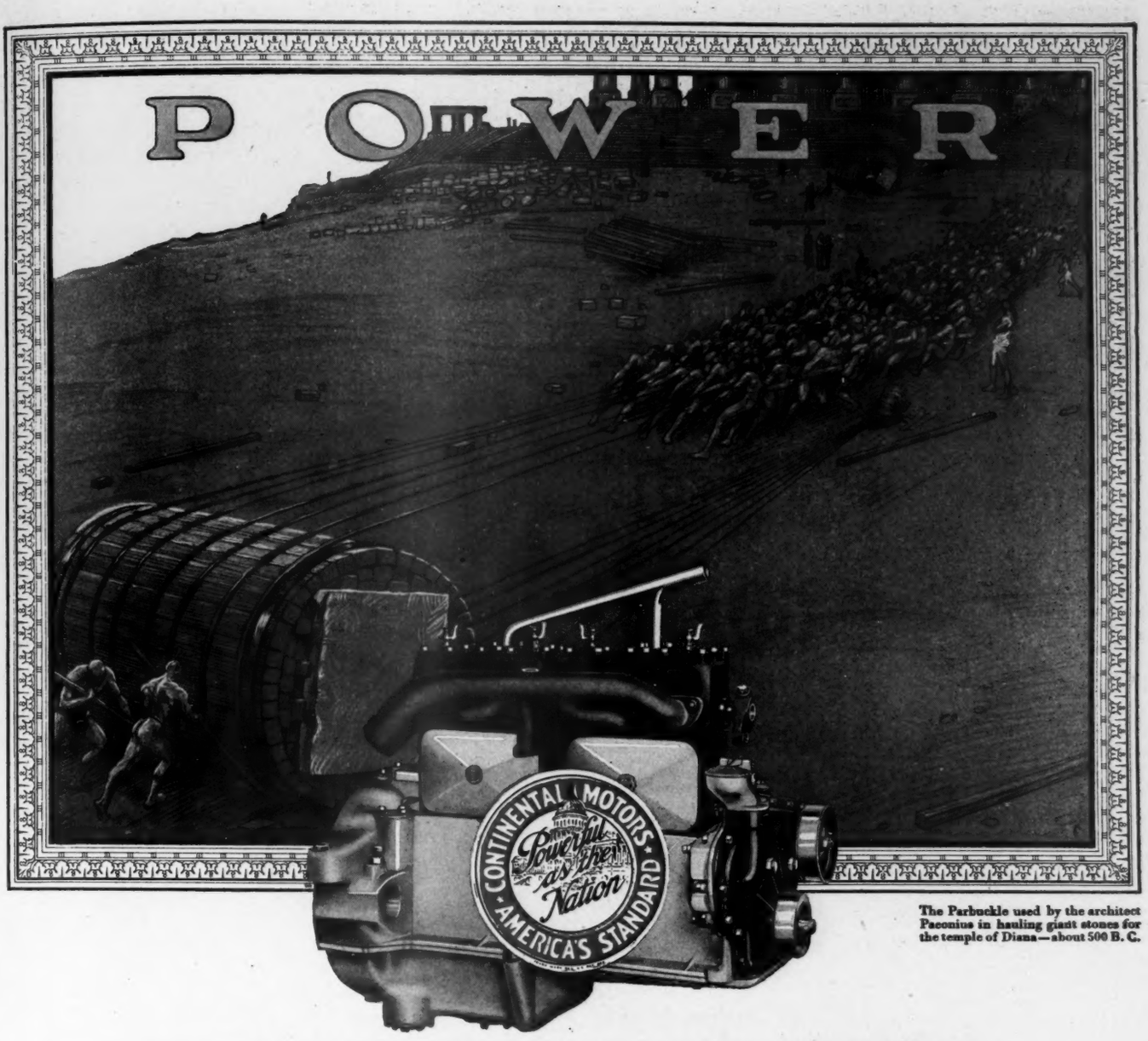
TRANSPORT TRUCK COMPANY
Mount Pleasant, Michigan

Builders of "The Frictionless Truck." Four models: for 2,000, 3,000, 5,000 and 7,000 pound service. Pneumatic tires optional at extra cost on all models.

TRANSPORT TRUCKS
HONEST VALUE, ALL WAYS

TRANSPORT

INTERNAL GEAR DRIVE TRUCKS



The Parbuckle used by the architect Paconius in hauling giant stones for the temple of Diana—about 500 B. C.

The outstanding characteristic that dominates the history of the development of power-producing mechanism, is the energy with which all creeds and all races have striven to achieve perfection. ¶ And the same characteristic is apparent today where Continental Motors are produced. Not only the maintenance of Continental standards of quality, but the consistent development of the Continental product to keep pace with the march of the industry—THESE are the factors that assure the continued supremacy of the motor that is known everywhere by the mark on its crank-case—the Continental Red Seal.

CONTINENTAL MOTORS CORPORATION

Offices: Detroit, U. S. A. **Factories: Detroit and Muskegon**

Largest Exclusive Motor Manufacturers in the World

Continental Motors

STANDARD POWER FOR TRUCKS, AUTOMOBILES AND TRACTORS

Prevent This

by Installing Gill One-Piece Piston Rings

A GLUTTON FOR OIL

Every puff of smoke from a truck has a silver lining—a lining of good old American ***silver dollars.***

White smoke means faulty carburetion—gasoline being consumed without delivering its stored-up power.

Black or ***blue*** smoke means that the piston rings are leaking. Oil is working up into the combustion chamber where it is burned without accomplishing ***anything.***

In either case the effect on one's pocketbook is disastrous.

If there's a little smoke just occasionally, don't be alarmed. But if that truck persists in puffing smoke like a locomotive, get busy and do something to save money and to save the truck.

When the smoke's white, look to the carburetor. When it's black or gray blue and the cylinders aren't scored or out of round, the piston rings are at fault. For the good of truck and pocketbook install a set of new ones right away.

Thirty-three Branch Offices prepared to give practically 24-hour service on Gill One-Piece Piston Rings to ***every*** jobber, supply store, dealer, garage and repair shop in the country.

The **Gill Manu· Chicago.**

Sole Foreign Agents:
AUTOMOTIVE PRODUCTS CORPORATION
Woolworth Building, New York, N. Y.

Gill

One-Piece Piston Rings

Assure this

A GLUTTON TOO, BUT FOR WORK

A truck that leaves behind it no trail of tell-tale white or gray blue smoke is making money for its owner at every turn of its wheels.

It *isn't* burning needless quantities of gasoline and oil.

One way of being sure that a truck motor will compress *all* of the gasoline into power; *not* pump oil; will *not* accumulate carbon; will *not* misfire; will *not* foul its spark plugs; and will *not* puff like a locomotive; is to install a set of Gill One-Piece Piston Rings.

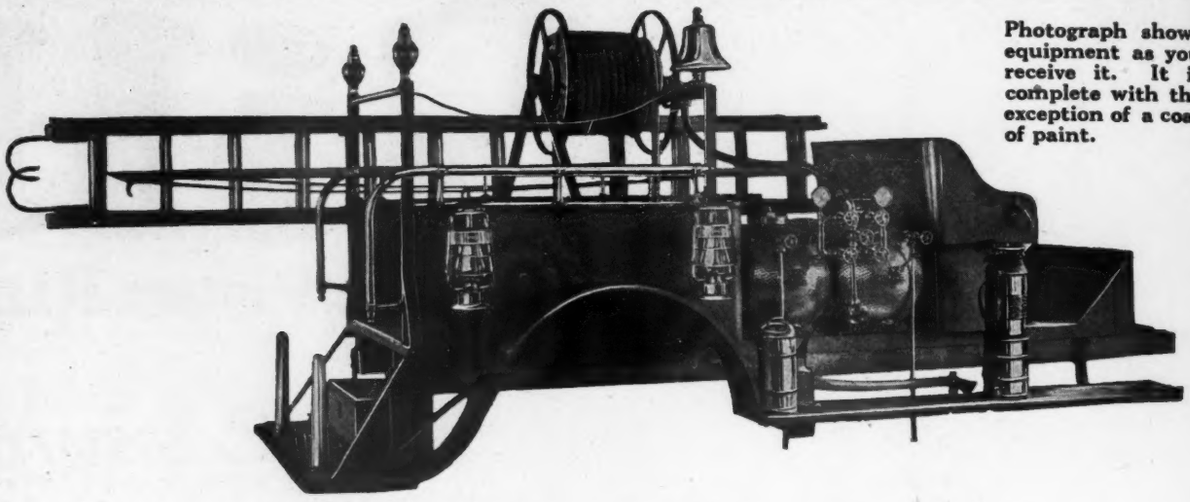
They have a patented lock-step leakless joint. *They* are cast in one piece from special gray iron that withstands all the ravages of heat. *They* maintain an always firm, snug contact with the cylinder walls. *Nothing* can leak past them.

Gill Piston Rings make a motor run *more* smoothly on *less* oil; and deliver *increased* power with *decreased* gasoline consumption. Truck owners everywhere are installing them because it pays in the long run.

Identify the Gill One-Piece Piston Ring by the joint, but do not measure its merit by the joint *alone.*

-facturing Company
Illinois

Canadian Manufacturer:
BROWN ENGINEERING CORPORATION
Toronto, Ontario



Photograph shows equipment as you receive it. It is complete with the exception of a coat of paint.

MAKE A DOUBLE PROFIT ON THE TRUCK YOU NOW SELL!

CHILDS APPARATUS is now made to fit any chassis—that means we can supply you with apparatus complete, ready to go on any make of motor truck you sell, giving you a new opportunity to make two profits where there was only one before.

Makers of Fire Apparatus for the past 20 years

You get this sturdy, dependable equipment all complete, except a coat of paint; it hooks up to the chassis by tightening some bolts. Then you deliver the fire department truck complete.

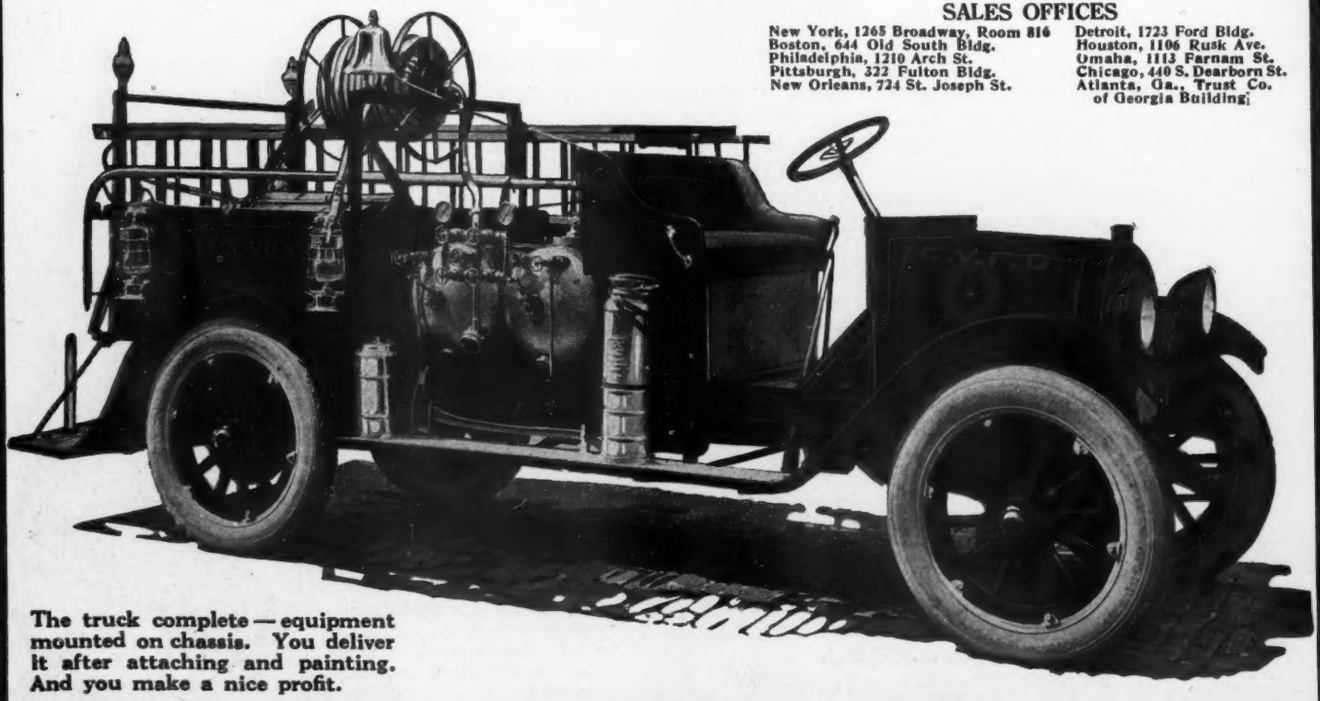
Or, if you prefer, you can deliver the chassis to us and we will mount the equipment, paint the entire outfit and ship you the completed car.

Sell a fire truck to your town. A chance for a sale you never made before—a profit that you have been missing.

O. J. CHILDS COMPANY, UTICA, N. Y.
FIRE APPARATUS

SALES OFFICES

New York, 1265 Broadway, Room 816
Boston, 644 Old South Bldg.
Philadelphia, 1210 Arch St.
Pittsburgh, 322 Fulton Bldg.
New Orleans, 724 St. Joseph St.
Detroit, 1723 Ford Bldg.
Houston, 1106 Rusk Ave.
Omaha, 1113 Farnam St.
Chicago, 440 S. Dearborn St.
Atlanta, Ga., Trust Co. of Georgia Building

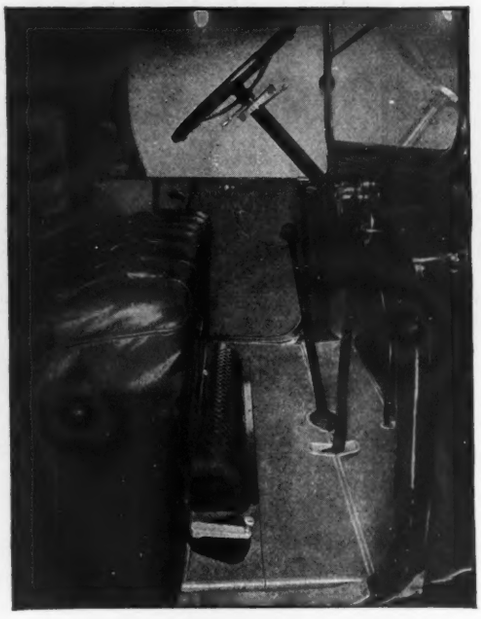


The truck complete—equipment mounted on chassis. You deliver it after attaching and painting. And you make a nice profit.

MONARCH
Governor
for
Trucks
and
Tractors
CONTROL
Motor TRUCK CO
MOTOR TRUCK MANUFACTURERS
GUARANTEE
LIMITS THE
SPEED AND
THE EXPENSE
Protects the
manufacturers
guarantee
MONARCH GOVERNOR CO.
U.S. PATENTS
FEB. 9 1915
OTHERS PENDING
MONARCH
PATENTED IN
FOREIGN
COUNTRIES
DETROIT, MICH. U.S.A.
COMPANY

PERFECTION MOTOR CAR HEATERS

"The Heat is There —Why Not Use It?"



PERFECTION MOTOR CAR HEATERS

"The Heat is There —Why Not Use it?"

Type DWS Heater in Delivery Car

Helps Make Winter Deliveries on Scheduled Time

THE value of making your truck drivers comfortable in inclement weather cannot be overestimated.

It means prompt delivery schedules—satisfied customers—less trouble with your drivers—more *speedometer* mileage per day.

Street car vestibules are heated. Why? Because labor demands comfortable working conditions. Traction companies would not dispense with heated vestibules even though they could do so because the present arrangement is far more efficient than the old method.

A PERFECTION MOTOR CAR HEATER may be readily installed in new or old trucks. Now used by forty-five passenger and commercial car manufacturers as standard equipment. The investment is small but the returns are large. Utilizes exhaust gases. No operating expense—"The Heat is There—Why Not Use It?"

The service of our engineering department is at the disposal of truck manufacturers and fleet owners.

THE PERFECTION HEATER & MFG. CO.

6552 CARNEGIE AVENUE **CLEVELAND, OHIO**

Manufactured and sold in Canada by Richards-Wilcox Canadian Co., Ltd., London, Ontario

The new GARCO national advertising campaign starts in November. Bigger, more persistent and more impressive than ever. GARCO has taken hold of the public interest the way it takes hold of brakes.

The GARCO adjustable-compartment display cabinet is the final, psychological reminder that ends in the customer digging down for the change to buy. Free to dealers who exhibit the right GARCO spirit—and stock.

"Yes, I've heard a lot about GARCO"

GARCO on display; GARCO steadily advertised; GARCO *solidly woven;* GARCO supported by a quarter century experience in asbestos products manufacture; GARCO proving itself absolutely unequalled for dependability and long wear. There's a combination for clinching customers! And bringing them back! We put GARCO into the dealer's hands with all these sales-making advantages.

Solidly woven, wire-reinforced construction gives GARCO a natural, permanent compactness. No distortion—no softening, swelling, flattening nor loosening fabric; no tearing, shredding nor pulling apart. And the special Garco heat-, moisture- and oil-resisting compound gives GARCO a never-diminishing gripping power. GARCO is as serviceable when at last worn to wafer thickness as when first applied.

Cars will soon be going in for winter repairs. Brakes will be relined. Now's the time to get the Garco proposition. Write—whether dealer, repair shop or jobber.

Carco Transmission Lining for Ford Cars

Garco Gaskette Roll

GENERAL ASBESTOS AND RUBBER COMPANY
Main Office and Factories, Charleston, S. C.

BRANCHES AND COMPLETE STOCKS
58 Warren Street, New York 311 Water Street, Pittsburgh
14 North Franklin Street, Chicago

GARCO
ASBESTOS BRAKE LINING

ASBESTOS PRODUCTS · PACKINGS · BRAKE LINING · TEXTILES
TRADE ARCO MARK

ASBESTOS PRODUCTS

Packings

Locomotive Throttle and Air Pump Packings
High Pressure Piston Packings
Valve Stem Packing
Medium and Low Pressure Packings
Perfect Valve Rings
Flax Packings
High, Low and Medium Pressure Sheet Packings
Gaskets and Gasketing Material
Asbestos Wick and Rope
Asbestos Cement

Asbestos Automobile Specialties

Brake Lining
Transmission Lining for Fords
Cone Clutch and Disc Clutch Facings
Asbestos Spark Plug Yarn

Asbestos Textiles

Cloth Yarn Cord
Carded Fibre Braided Tubing

TWIN CITY TRUCKS

Built to do the work—not to meet a price. Two models: 3½-ton and 2-ton.

We invite correspondence from reliable distributors in territories not yet closed.

BRANCHES:

Lincoln, Neb. — Great Falls, Mont.
Des Moines, Iowa — Wichita, Kansas
Denver, Col. — Fargo, N. D.
Peoria, Ill. — Kansas City, Mo.
Indianapolis, Ind. — Spokane, Wash.
St. Louis, Mo. — Salt Lake City, Utah

Canada:

Minneapolis Steel & Machinery Co. of Canada, Ltd.—Winnipeg, Man.; Regina, Sask.; Calgary, Alta.

Export Office:

Minneapolis Steel & Machinery Co.—154 Nassau St., New York City

Twin City Company
Selling Products of
Minneapolis Steel & Machinery Company
Minneapolis, U. S. A.

Distributors:

Frank O. Renstrom Co.—San Francisco, Los Angeles, Stockton, Oakland, and Sacramento, Calif.

Baskerville & Dahl Co.—Watertown, South Dakota

Southern Machinery Co.—Atlanta, Ga.

R. B. George Machinery Co.—Dallas, Houston, Amarillo, San Antonio, Texas and Crowley, La.

J. Z. Horter Co.—Havana, Cuba

SPRINGS, WIRE & STEEL
EST.
"BARNES-MADE" PRODUCTS
1857
SCREW MACHINE PRODUCTS

ALL Are— "Barnes-Made" Products

High-Grade Springs

Brush Holder, Electrical, Coil, Machinery, Valve, Drop-forged, Special Small Flat, Milled, Wire and Auto Clutch Springs. We design and manufacture Springs of steel, brass, phosphor bronze or vanadium for every purpose, according to specifications.

Screw Machine Products

Made to order up to 1⅛ inches in diameter, from steel, brass or any metal. In plain, plated, case-hardened or any other finish—regardless of quantity or exacting requirements.

Washers, Stampings, Etc.

Spring Washers made to order only—from spring steel, brass or phosphor bronze. Unusually complete facilities insure quick work. Orders for small press work and simple stampings handled economically.

Anticipate your specifications now, and we'll meet your weekly or monthly requirements promptly

Write for Catalog No. 8

The Wallace Barnes Company

"Spring Makers for Three Generations"

Main Office and Works: Bristol, Conn.

Western Sales Division, Book Bldg., Detroit

Schatz UNIVERSAL Annular BALL BEARING

Highest in Performance

The proof of a bearing is its performance. Materials, workmanship, refinement in design, added strength and capacity, all are contributory to the single purpose. Smooth, silent, jam proof, almost wear proof, always equal to the emergency strain, the Schatz Universal Annular Ball Bearing has a proven record of performance wherever there is friction to be overcome.

Specify the bearing with a margin of safety—Schatz Universal

THE FEDERAL BEARINGS CO., Inc.
Poughkeepsie, N. Y.

Pacific Coast Representatives:
Frank M. Cobbledick Co., 693 Mission St., San Francisco, Cal.

Great Britain: 37 Sheen Road, Richmond, London

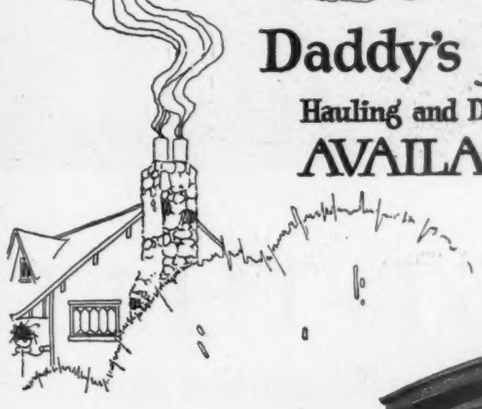
The Event of the Day~
Mother's Joy ~ Baby's bath

Mother's Joy~Giving a bath
to her 30 pound sugar plum

Daddy's Joy~His Money Maker

Hauling and Delivering by the Economical and Efficient

AVAILABLE TRUCK~*always available*

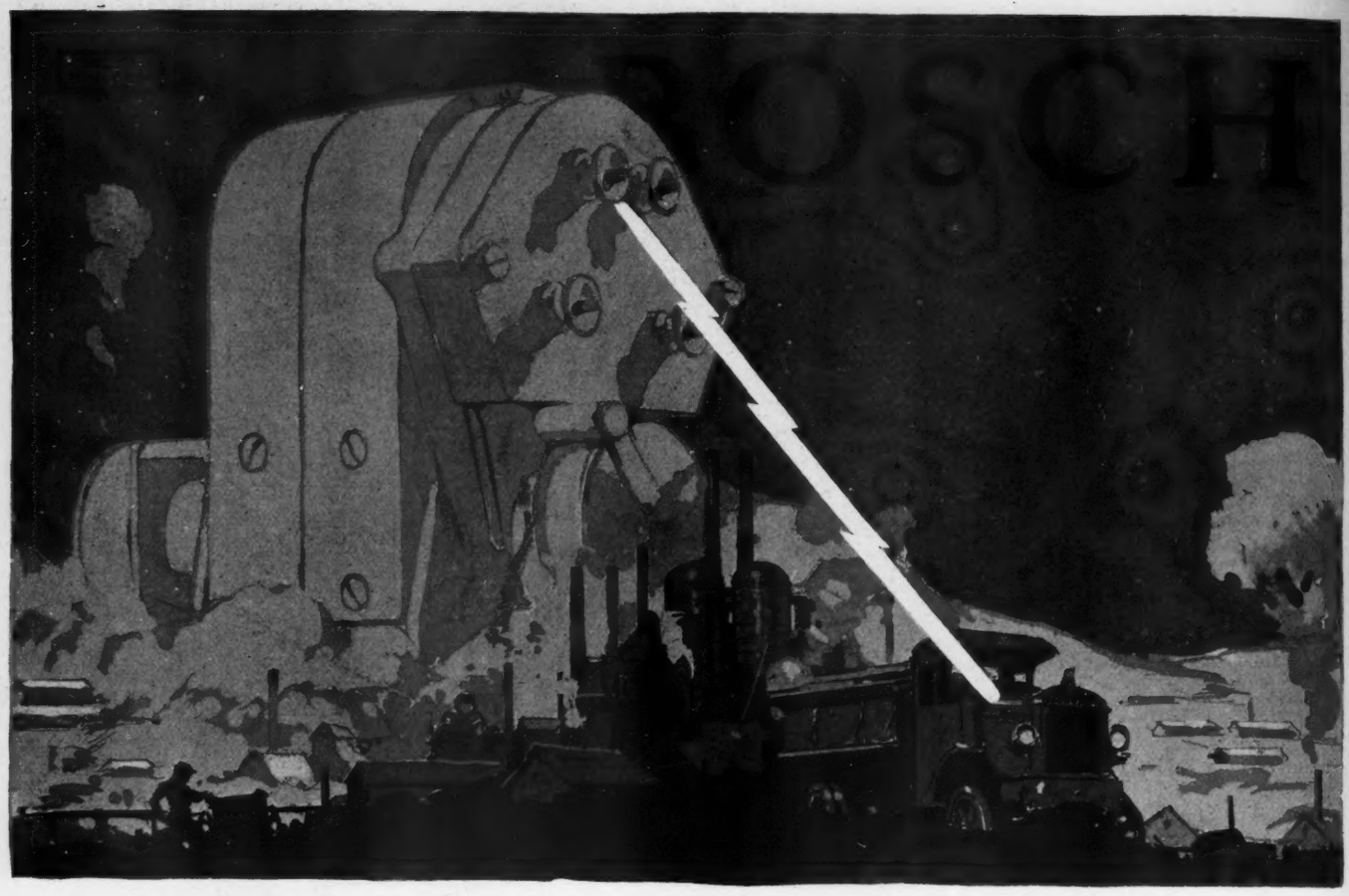


"The All-weather
Commodity Carrier"

Made in 1½ Ton, 2½ Ton, 3½ Ton,
5 Ton and 7 Ton Capacities

Daddy's Joy~Hauling
15000 Pounds of Sugar

Available Truck Co., *North & Kilpatrick Aves., Chicago, U.S.A.*



Trade-Mark
Reg. U. S. Pat. Off.

PUT THAT

With many good motor trucks on the market, it is important that the one you handle has special merit and selling features.

That's why you should insist on Bosch Magneto Ignition. It's one of the best "sales clinchers" you can get.

For twenty years Bosch High Tension Magneto Ignition has been universally known and recognized as the system which insures greatest

AMERICA'S SUPREME
MOTOR TRUCKS - TRACTORS - AIRPLANES - MOTOR CARS

SALE OVER!

efficiency, dependability and economy in a gas engine. It's an enviable reputation that every live dealer is striving to put on his selling force. Add this Bosch sales asset. Specify Bosch High Tension Magneto Ignition on every order you send in. You can get it.

300 Service Stations in 300 Centers

AMERICAN BOSCH MAGNETO CORPORATION

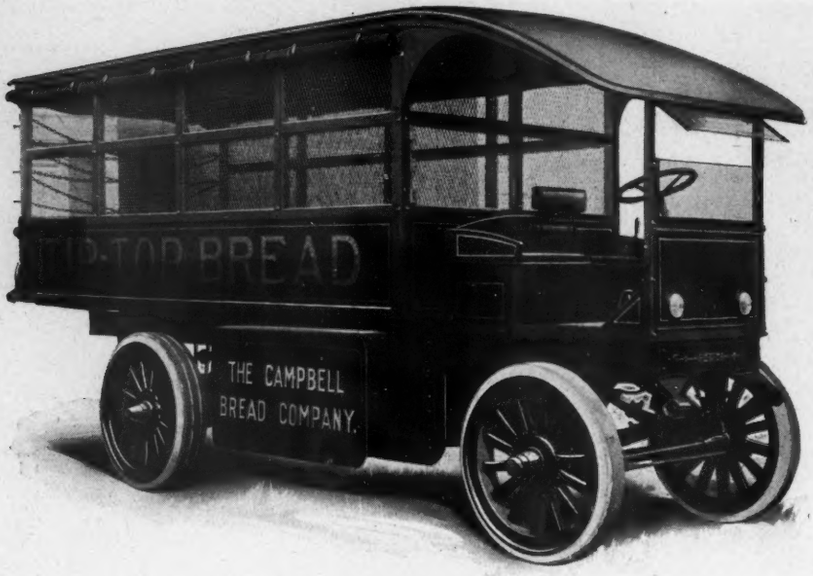
Main Office and Works: Springfield, Mass.

Branches: New York, Chicago, Detroit, San Francisco

Be Satisfied
Specify Bosch

IGNITION SYSTEM

MOTOR BOATS - MOTORCYCLES - GAS ENGINES - ETC.



Are You Falling Down on Delivery-Car Sales?

If you are, isn't it because prospects say the operating cost of your gasoline-driven cars is excessive?

And they are right!

For short-haul, frequent-stop deliveries Ward Electrics are unquestionably much more economical to use.

Figure it out for yourself. A small Ward Electric operates at current cost of approximately one cent per mile. Larger sizes in proportion.

Repair bills are exceedingly few and far between—the construction is so simple and trouble-free. Tires frequently last two years and sometimes more.

The almost total elimination of vibration and the even pull naturally give Ward Electrics a far longer life than gasoline-driven trucks.

When the gasoline-motored car stops, the engine continues to consume fuel unless the power is shut off. When the Ward Electric stops, the motor automatically stops *and all expense stops.*

Point out these low operating facts to your prospects. Show the bakeries, laundries, groceries and the well nigh numberless other businesses which make daily short-stop deliveries, that Ward Electrics easily clear 35 to 45 miles on a single charge. Explain their utter simplicity and ease of handling.

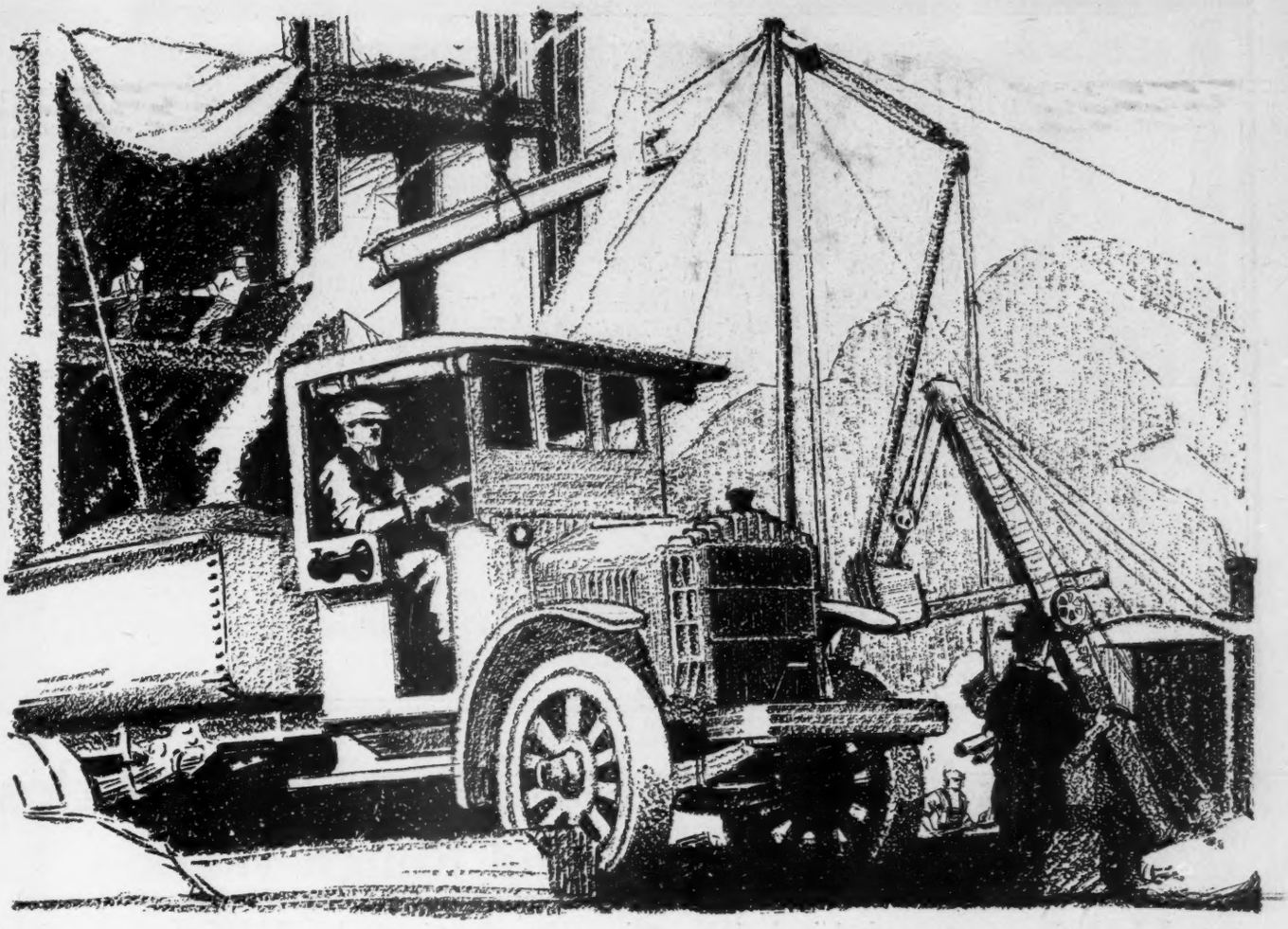
And watch your delivery-car sales straightway begin to climb.

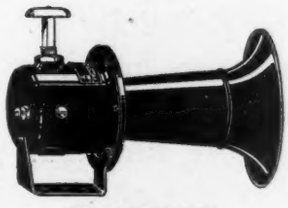
It will assuredly pay you well to learn in detail how to speed up your delivery-car sales. Phone, wire or write.

Capacities:
750 to 10,000 pounds
Speed: 10 miles per hour

Ward Motor Vehicle Co.
Mt. Vernon, N. Y.

WARD ELECTRICS





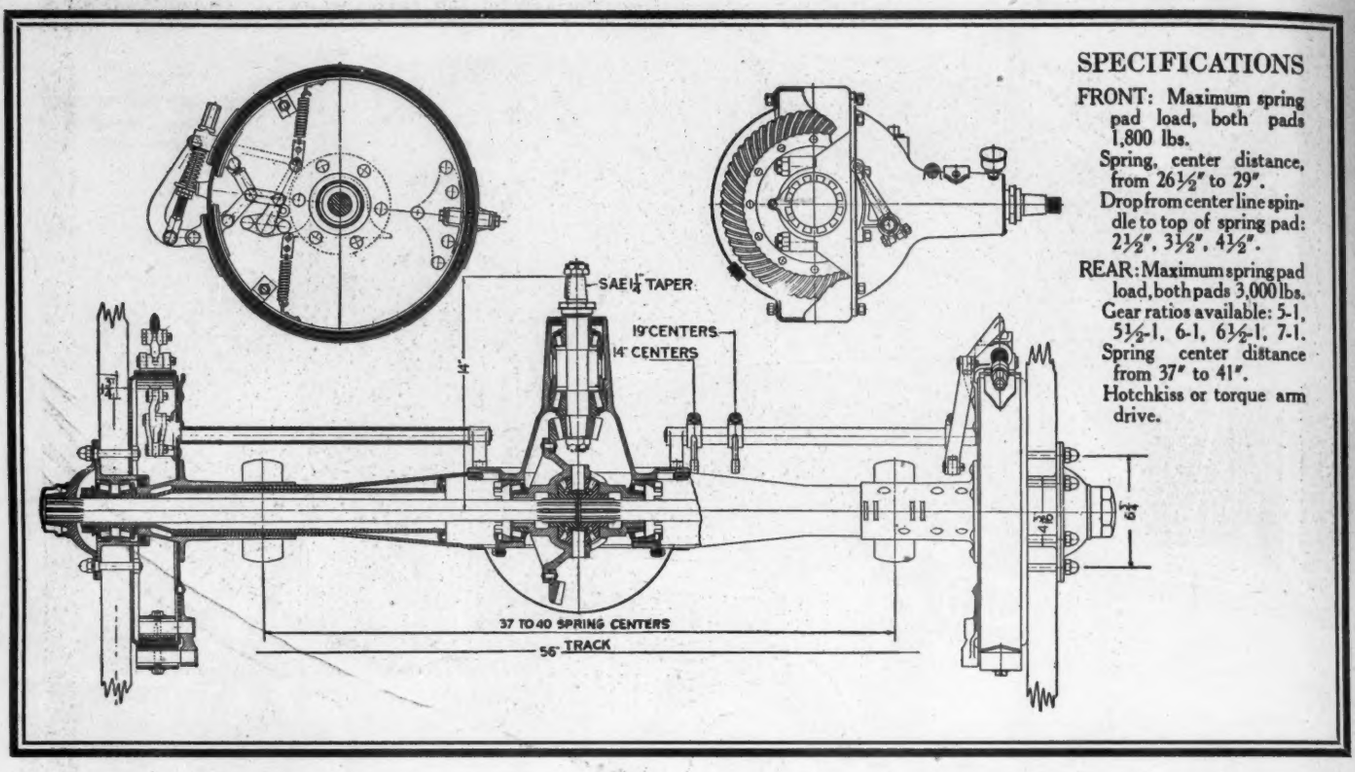
KLAXON 3-V
$5.75

A heavy duty signal for trucks—powerful, sturdy. Powerful—so that its warning will always be heard. Sturdy—so that careless blows upon its push rod will not harm it.

For *Sound* Satisfaction Oil Your Klaxon

KLAXON

Company :: Newark, N.J.



SPECIFICATIONS

FRONT: Maximum spring pad load, both pads 1,800 lbs.
Spring, center distance, from 26½" to 29".
Drop from center line spindle to top of spring pad: 2½", 3½", 4½".

REAR: Maximum spring pad load, both pads 3,000 lbs.
Gear ratios available: 5-1, 5½-1, 6-1, 6½-1, 7-1.
Spring center distance from 37" to 41".
Hotchkiss or torque arm drive.

Columbia Special Bevel-Gear Truck Axles

Built for High Speed and Rough Work

WE have succeeded in building into Columbia Special Axles for one-ton, high-speed trucks a power or resistence to antagonistic forces and road strains, that gives remarkable efficiency and durability under the roughest handling.

The Special Columbia Rear Axle for this light-truck duty is built on exactly the same principles as all Columbia One-piece-housing Rear Axles. The one-piece-housing provides 50% more torsional strength than other designs.

We also build extra strong front axles for this special service

THE COLUMBIA AXLE COMPANY
Cleveland, Ohio

Ready for Business

Drive Up — How Many

Let us handle your oil storage problems. Write TODAY for literature

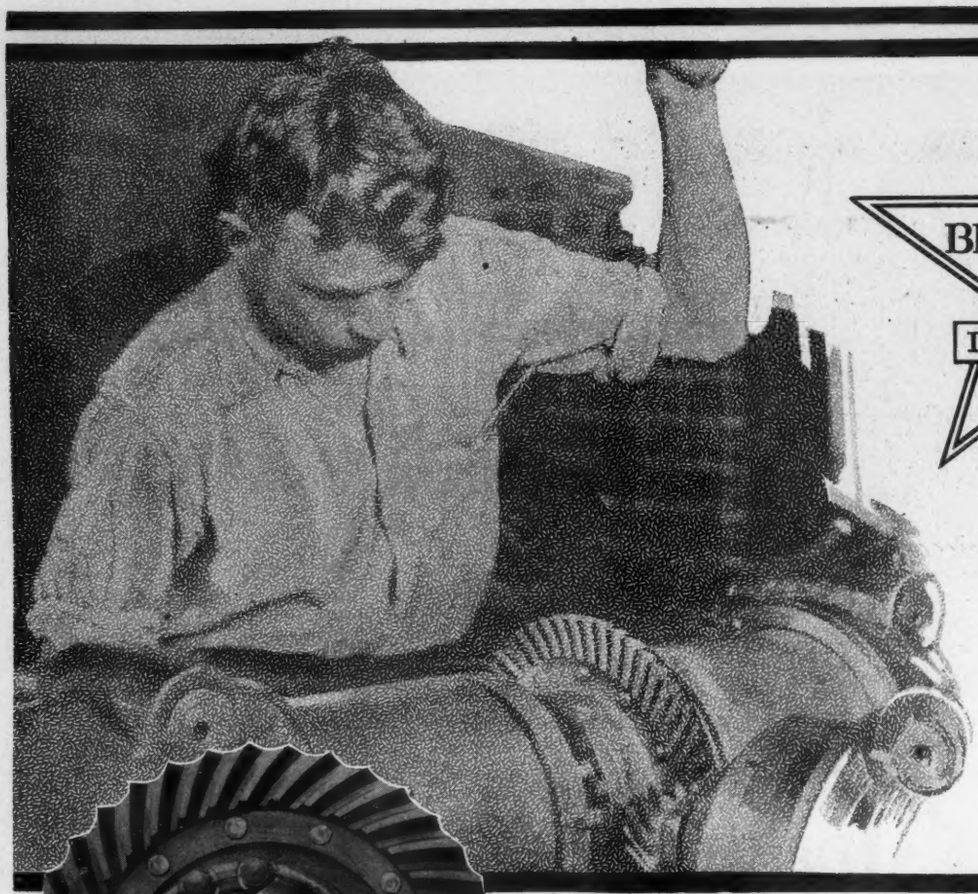
Install a BOWSER and be ready for the ever increasing gasoline and oil trade. Your customers will be assured of quick delivery; clean, accurate service, and can count on oils of the highest efficiency. Your profits will increase thru more sales and accurate checking in and out of oils.

S.F. BOWSER & CO., INC
FORT WAYNE, IND.
OFFICES IN PRINCIPAL CITIES

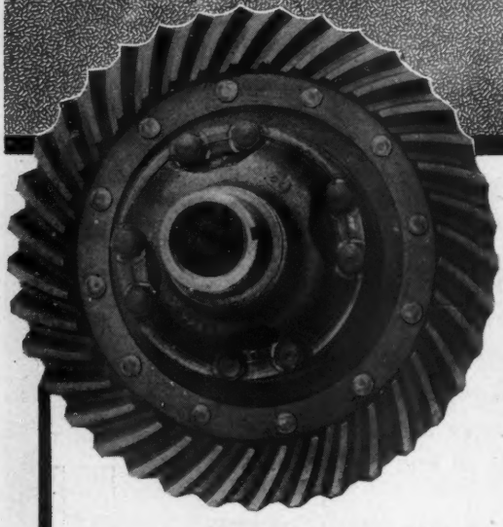
BY INVITATION MEMBER OF

S.F. BOWSER & CO., OF TEXAS
DALLAS, TEXAS

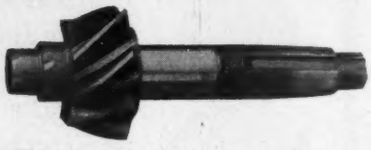
S.F. BOWSER CO., LTD
TORONTO, CANADA



BROWN-LIPE CHAPIN DIFFERENTIALS



58 out of 120 Operations are Inspections



IF YOU could follow a certain standard part through the Brown-Lipe factories you would learn that it takes 62 operations to actually form it and heat-treat it.

You would see its correctness challenged 58 times—after every major operation and after every minor one—by rigid inspections, tests and checking.

It is this constant guarding against error, from mill shipments through all operations to final delivery, that assures a product of uniformly high quality.

Car and truck manufacturers and users can have no better protection than this.

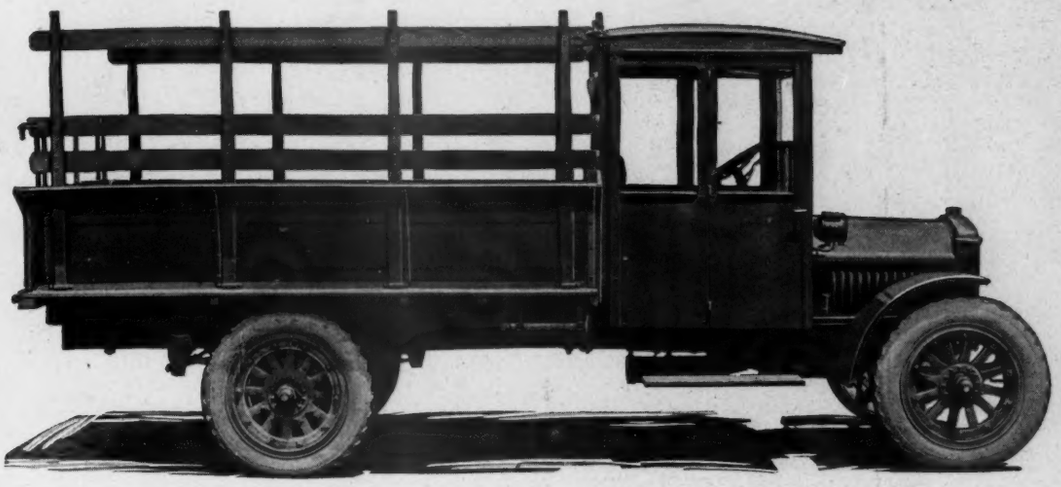
BROWN-LIPE GEAR TRANSMISSIONS

BROWN-LIPE GEAR CO.
TRANSMISSIONS

BROWN-LIPE-CHAPIN CO.
DIFFERENTIALS

BOTH AT SYRACUSE, N. Y.

No. 16 of 40 Reasons for Superiority



Order Highland Cabs and Bodies with Your Truck Chassis!

The Highland Line

"EVERYDAY" CLOSED CABS

HIGHLAND OPEN CABS

"EVERYWAY" FARM BODIES

HIGHLAND STAKE BODIES

HIGHLAND EXPRESS BODIES

PITTSBURGH DISTRIBUTOR:
Pittsburgh Commercial Body Co.,
5978 Centre Avenue, Pittsburgh, Pa.

HERE is a plan by which you can supply your truck customers promptly with high-grade cabs and truck bodies at a price that will compare favorably with that of the local body builder—and still allow a good profit on the deal for you.

You do not need to tie up your own money in stock.

The Highland Body Company's Detroit branch—and the Cincinnati factory—carry constantly in stock, ready for prompt shipment, open and enclosed cabs, stake, express, and farm bodies.

Distributors and branches are also being established in the leading motor truck distributing centers.

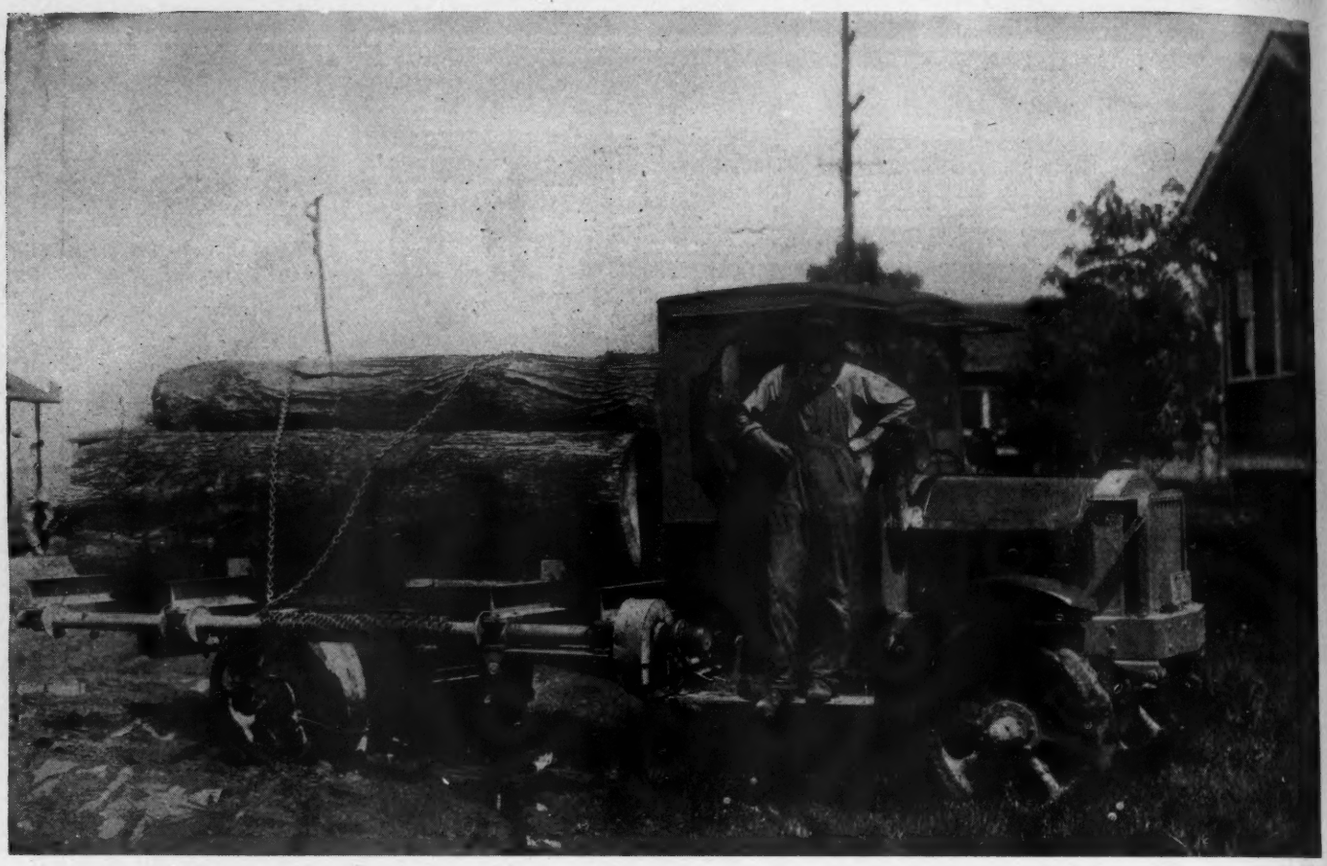
So a body can be loaded in the same car with a chassis, or attached to the chassis in case of a drive away. You get low full car load freight rates, and prompt full car load delivery.

Highland bodies are well and favorably known in the trade. They are produced by specialists in truck body construction and turned out on a manufacturing basis. The designs are tried and proven. The material and workmanship are the best.

Write for descriptive literature and terms and discounts which make this a profitable proposition for truck dealers.

THE HIGHLAND BODY COMPANY
CINCINNATI, (Elmwood Place,) OHIO
Greenwood & Holden Aves., DETROIT, MICHIGAN

HIGHLAND STANDARD CABS *and* BODIES



Note the Rear-Wheel Chains—They End Road Delays

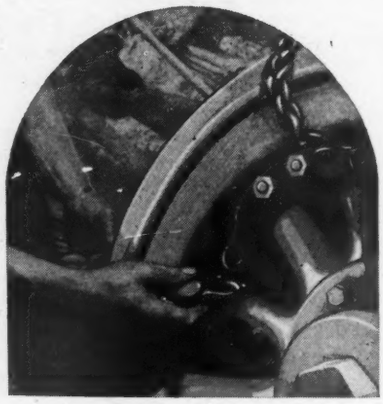
Traction In Two Minutes

The truck equipped with Giant Grip Traction Equipment never balks at rough roads or heavy going.

The driver knows he can pull through quickly and dependably under any conditions. He simply takes his chains from the tool box and hooks them on the permanent wheel-clamps when needed. Two minutes' time to do the job and the truck is on its way. No tools but his own bare hands. No jacking up the wheels.

Truck owners in all lines of trade are having their units equipped with Giant Grips.

Dept. 10



Established 1863

Easy for You To Sell

Go after the Giant Grip sales that are ready in your territory. Show truck owners how they can keep their trucks operating the year round.

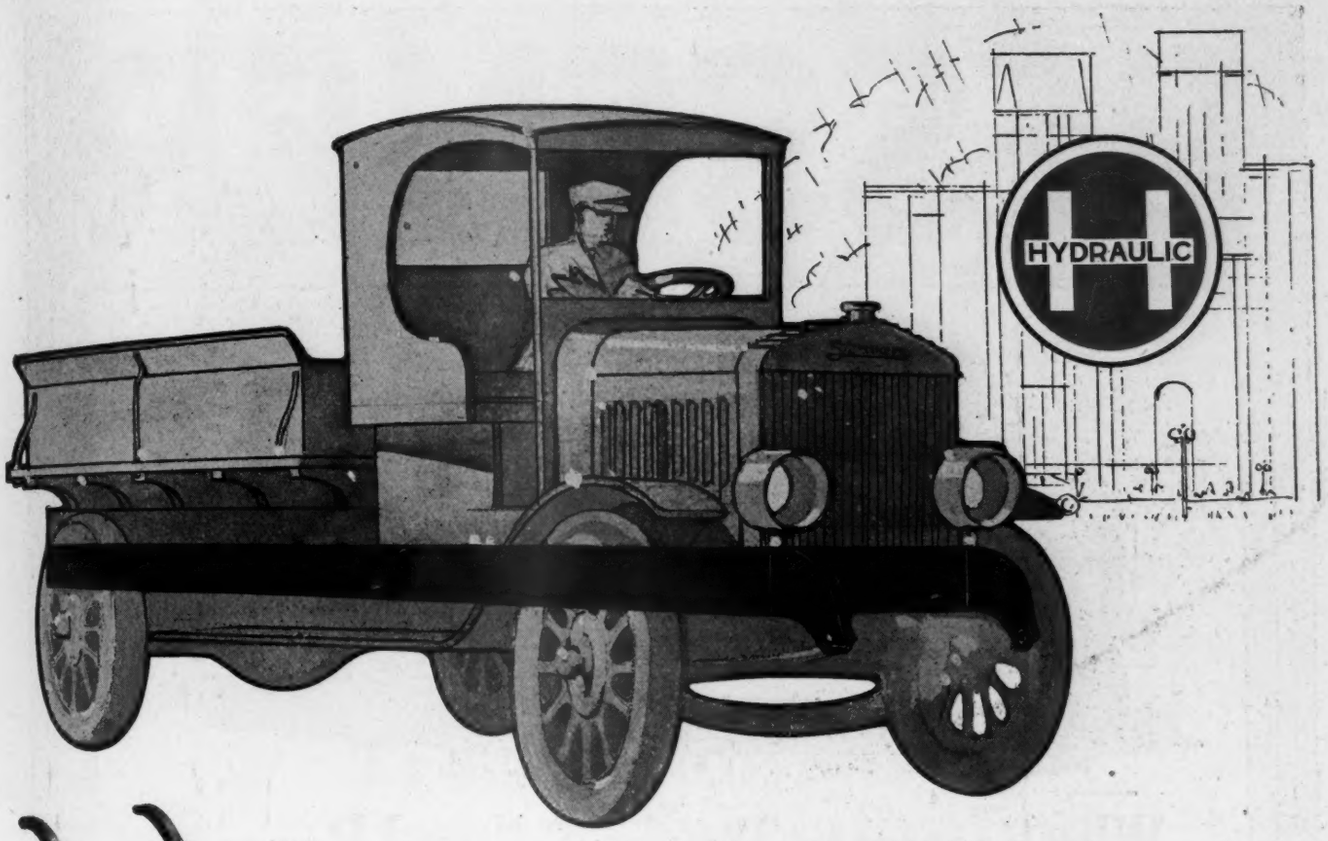
The Giant Grip line provides for every type of wheel and tire. Yet you have fewer models to handle. This means a small investment and a quick turnover. A profitable seller for hardware men, garages, service stations, etc.

Write for booklets and prices now and take advantage of our fall and winter advertising.

Giant Grip Mfg. Co. **Formerly Challoner Company** **Oshkosh, Wisconsin**

Giant Grip

Traction Equipment for Motor Trucks



Hydraulic *consistently* builds Frames just as the truck manufacturer wants them.

Specifications are perfectly met from steel made in our own furnaces and fabricated by Hydraulic men.

Thus, one Hydraulic Frame is the counterpart of another, each the exact replica of your submitted design. Definite uniformity in the steel assures definite uniformity in the Frame.

And further, the fact that Hydraulic controls all operations makes dependability *not* a by-word but a *commodity* which we deliver with every order.

Manufacturers of

Pressed Steel Frames for Passenger Cars, Trucks and Tractors; Axle Housings; Brake Drums; Torque Arms; Running-Boards; Step Hangers; Hub Flanges; Discs; Dust Shields; Steel Barrels; Aeroplane and Miscellaneous Stampings.

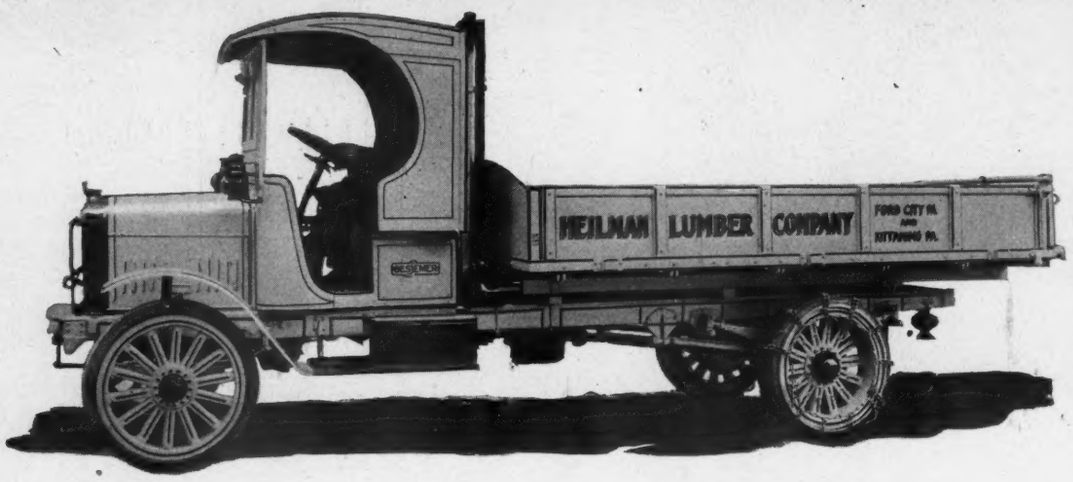
THE HYDRAULIC PRESSED STEEL COMPANY
of THE HYDRAULIC STEEL COMPANY
CLEVELAND, OHIO

Branch Sales Offices:

New York	Chicago	Detroit	San Francisco
Singer Building	Fisher Building	Book Building	Hearst Building

HYDRAULIC
PRESSED STEEL COMPANY

BESSEMER



Why Bessemer Trucks Sell and Repeat

Keeping Bessemer dealers and their customers satisfied is of more importance to us than signing up new dealers or even piling up a quantity sale on Bessemer Trucks. We realize that to produce more business a dealer must have 100 per cent backing from the truck manufacturer.

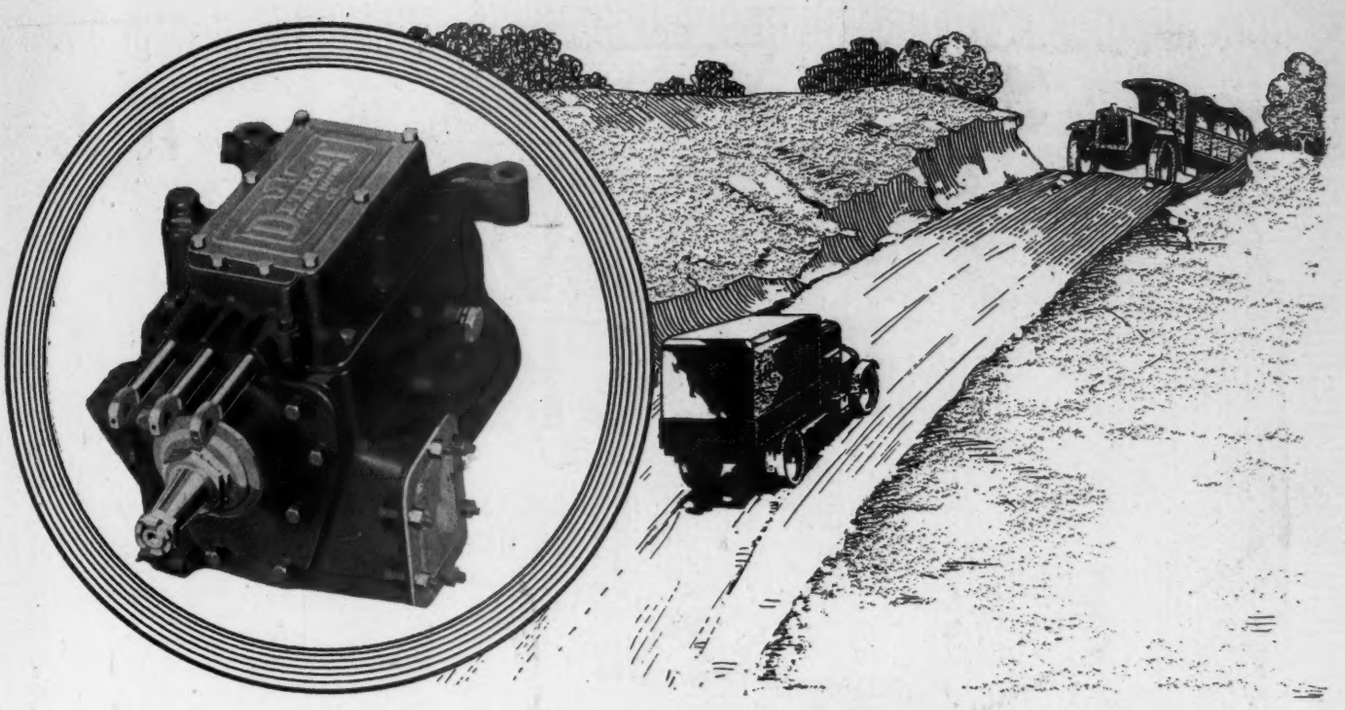
If the dealer can get adjustments and replacements from the factory without waste of time or controversy; if the truck owner is kept "sold" on the truck, and if the truck itself delivers dollar for dollar value with a minimum of repairs and depreciation—sales are bound to be made and repeat orders result. *And that is the Bessemer Motor Truck proposition all through.*

Bessemer Trucks have the kind of stamina that makes for years of hard, every-day road service. This fact is best proved by the great number of new orders lately received from organizations and corporations already owning from one to a fleet of Bessemer Trucks. Bessemer Trucks include 1, 1½, 2½ and 4 ton models.

If you are seeking a line of trucks that offers worthwhile co-operation from the factory's end, and a truck which, value for value, unit for unit, compares to advantage with any other truck at its price, learn more about the Bessemer dealership proposition. Drop a postcard for detailed information.

BESSEMER MOTOR TRUCK COMPANY
GROVE CITY, PA.

MOTOR TRUCKS



Truck Transmissions Demand Specialization

The reputation of DETROIT TRANSMISSIONS stands upon performance.

Not merely past performance—which is brilliant indeed—but on account of what DETROIT TRANSMISSIONS are accomplishing *now*.

The quality of materials used; the rigid inspections and tests to which, after each operation, every part is subjected; the high ideals which animate the personnel of this organization—are reflected in a quality of product that is flawless in design—strength—service.

This is best accomplished where the entire energies of an organization are concentrated on the production of the best transmission it is possible to build. This means specialization.

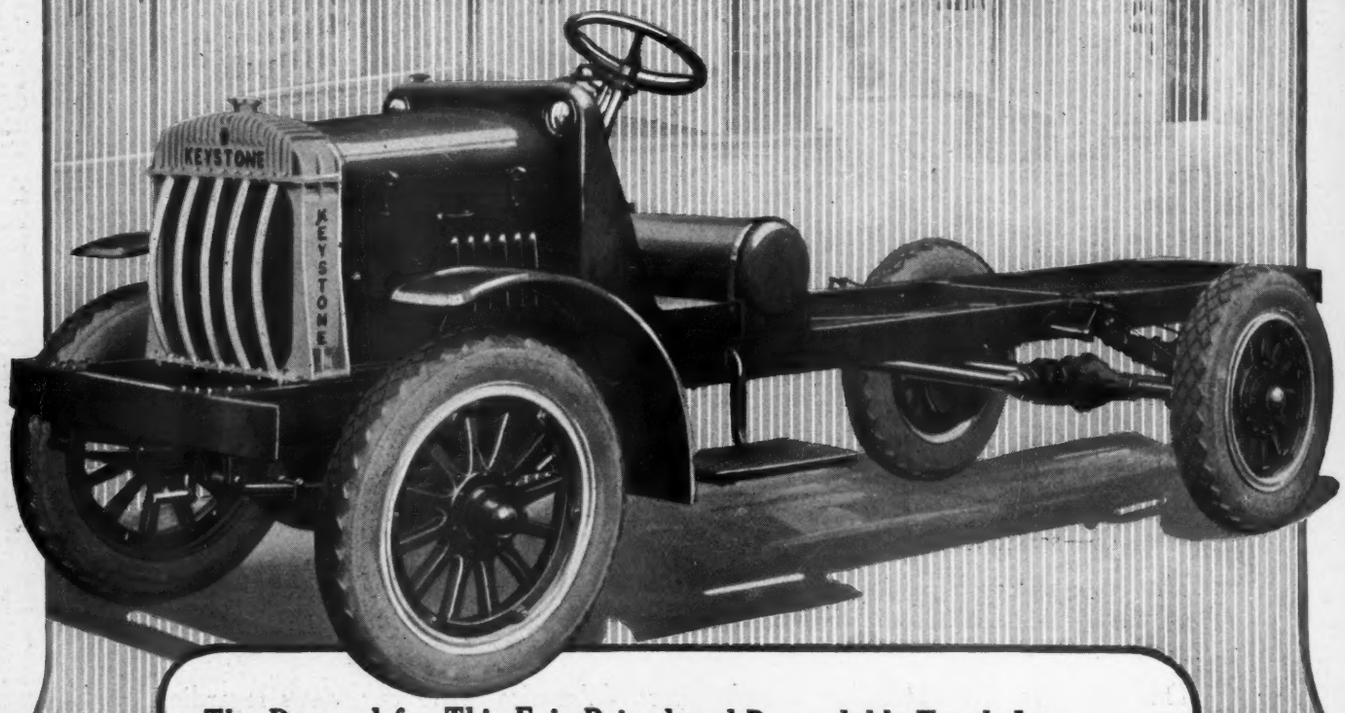
That the foremost automotive manufacturers of America share our views regarding DETROIT TRANSMISSIONS is evidenced by the following partial list of our customers.

Bethlehem Motors Corp.	Henry Ford & Son	Nash Motors Co.
Commerce Motor Car Co.	Jordan Motor Car Co.	Templar Motors Corp.
Federal Motor Truck Co.	Liberty Motor Car Co.	United States Government

Detroit Gear & Machine Co. Detroit, Michigan

DETROIT TRANSMISSIONS

KEYSTONE TRUCKS



The Demand for This Fair Priced and Dependable Truck Increases.
Enlarged Factory Space Enables Us to Keep Pace With the Demand.

Immediate Action Suggested for a Few Exclusive Franchise Territories Still Open

2 Ton Model:

All Pneumatics: Front 34 x 5, Rear 38 x 7..... $2550
All Solids: Front 34 x 4, Rear 36 x 6..... $2350
F. O. B. Factory

Motor: *Buda 4 cylinder, 3¾ x 5⅛, 30 H. P.* Ignition: *Berling Magneto, high-tension, water-proof.* Drive: *Spicer.* Carburetor: *Zenith Automatic.* Clutch and Transmission: *Fuller.* Rear Axle: *Russel Internal Gear.* Equipment Includes: *Pierce Governor, Whistle, Power Driven Tire Pump, Impulse Starter, etc.*

On request we'll send detailed specifications

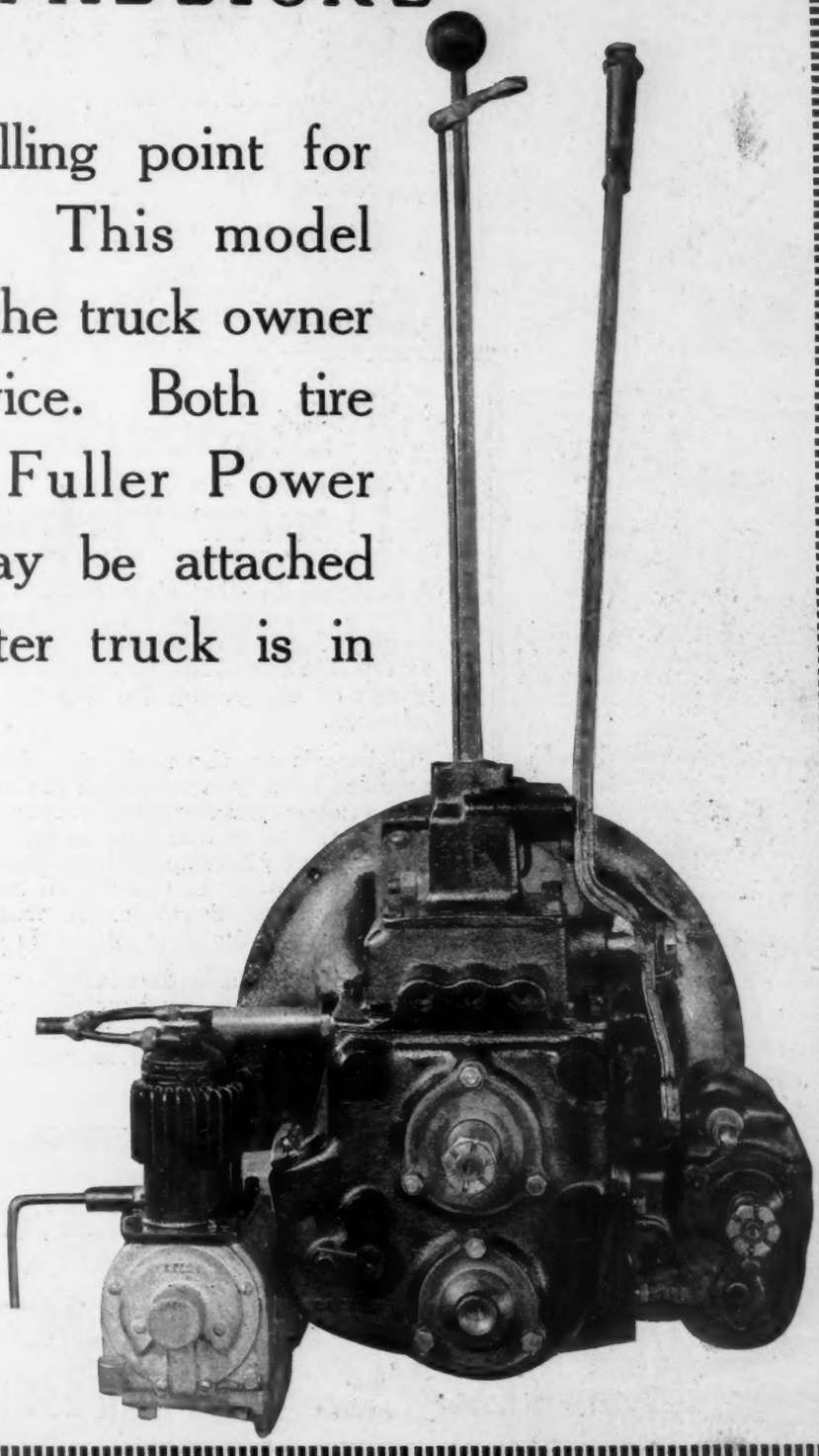
With Every Keystone Truck and Franchise Goes Factory, Sales and Service Co-operation. We Stand Back of Every Truck We Sell

Keystone Motor Truck Corporation

Sales Office and Showroom: Forty-second and Chestnut Sts.
Factories: Oaks, Penna.
PHILADELPHIA, PENNA.

FULLER
TRANSMISSIONS

A strong selling point for your truck. This model GU-5 gives the truck owner unusual service. Both tire pump and Fuller Power Take-Off may be attached any time after truck is in service.



Fuller & Sons Mfg. Co.

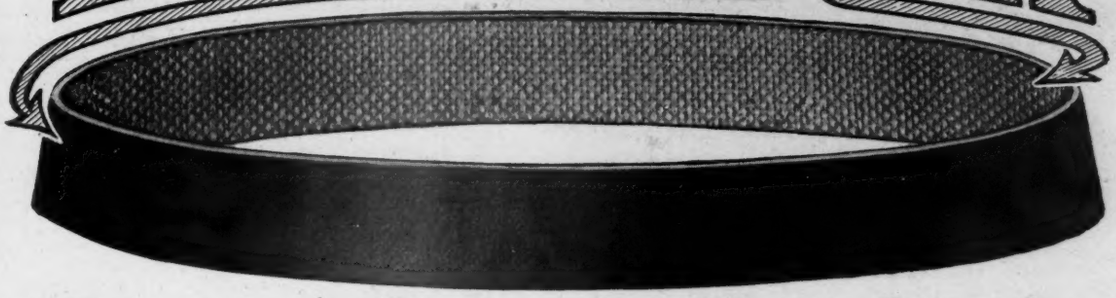
Kalamazoo, Michigan

SALES OFFICES

Detroit . . . . . 1515 Kresge Bldg.
New York . . . . . American Circle Bldg.
San Francisco . . . . . 144 W. Second St.
London . . . . . 24 and 26 Maddox St.

West Coast LUMBERMAN
American Lumberman
AMERICAN FRUIT GROWER
THE SOUTHERN LUMBERMAN
The RETAIL COALMAN
DISTRIBUTION & WAREHOUSING
AMERICAN EXPORTER
EL COMERCIO
Manufacturers Record
THE COMMERCIAL CAR JOURNAL
The COMMERCIAL VEHICLE
MOTOR AGE
MOTOR WEST
MICHIGAN MANUFACTURER AND
Standard TRUCKS
Standard
USA
Standard Dealer Helps
A Standard distributor's or dealer's contract includes the closest kind of factory co-operation. Advertising in National and local publications in the various industries is carried on, paving the way for the salesman.
Bill-boards on the main arteries to acquaint local prospects with the name of the nearest Standard dealer, attractive folders and other literature to tell how Standards may be adapted to any haulage duty, are a few of the things done by the factory to assist distributors in promoting the sale of Standard Motor Trucks.
Some very desirable Standard territory is still available. If you have the proper organization and facilities for distributing Standard Motor Trucks, write for detailed information.
STANDARD MOTOR TRUCK CO.
DETROIT
Awarded Gold Medal in the International Trials, June 21 to 26, 1920, Barcelona—Madrid, Spain
Standard MOTOR TRUCKS
Registered
MADE IN DETROIT USA
All the name implies
Economy and Reliability
Aiding the Lumbering Industry
For Economical Distribution
Distribution
"All the Name Implies"
STRENGTH
Reduce Your Haulage Costs
Every Day a Working Day with Standards
Standard MOTOR TRUCKS
USA
A Complete Line
Capacities 1, 2½, 3½, and 5 Ton

Leathertex



Cone Clutch Facings

Cost Less and Serve Better Than All-Leather Facings

Attention! Here is an opportunity to make a better truck at lower cost.

H. L. B. Leathertex—a combination of textile and specially tanned leather—makes the best facing for cone clutches on motor trucks. It "takes hold" quietly, gently and surely—starts the truck without jumping or jerking.

Leathertex is made on special machinery which insures absolute uniformity in thickness.

Leathertex is leather and textile merged into one unit under 3000 pounds hydraulic pressure. This makes a more uniform, resilient and durable facing than all-leather. It holds its shape better, thus reducing friction and increasing the life of the facing.

It possesses great tensile strength and can be used on heaviest trucks. Impervious to oil or water, it retains its superior qualities for a long time.

Despite its many advantages in added service and value, Leathertex really costs less than other facings.

Let us send you samples and information covering your next year's requirements.

HIDE, LEATHER & BELTING CO.
Indianapolis, U. S. A.

HAUL IT IN A HALL

Hall Trucks are the development of forty-six years experience in the fabricating and transportation of structural steel

There is More to Hall Dealership Than the Mere Selling of Trucks

THE post-war era of reckless spending is fast simmering down to normal thinking and careful buying. And under those conditions only the fit can survive.

Hall dealers have the substantial backing of an organization which has had 46 years experience in the fabricating of structural steel.

Hall dealers are in reality Hall partners—partners in our past success—partners in our future responsibility to permanently maintain Hall quality.

The demand for good motor trucks during the next five years is going to surpass that of any previous ten years in truck history. And we are ready by the completion of our new factory with an increased capacity of 500 Hall Trucks per month.

Write for catalogue and full particulars of our liberal selling agreement. There is still some excellent territory open—but you'll have to hurry.

Write for catalogue and full particulars of our liberal selling agreement

Hall Trucks are made in 2½, 3½, 5 and 5 to 7 Ton Models, any type of body. With this line you can fill any man's trucking needs

LEWIS-HALL MOTORS CORPORATION
DETROIT, MICHIGAN
Formerly Motor Truck Division of the Lewis-Hall Iron Works

Address Dept. 5

HALL TRUCKS

Conquering the Earth With Triangle B

AS the mighty tractor surges forward, dragging its gang ploughs behind it against the tremendous strains of the resisting earth, every Triangle B forging that has made its grim strength possible, says: "Rely on me! I shall not fail."

Half a century of Billings & Spencer knowledge—half a century of honest reputation—has made those steel forgings stand the strain of earth subdued.

Without this strength—without this resistant power—agriculture on the giant western scale would be impossible.

Triangle B is again making possible the development of a great human achievement.

Billings & Spencer have for over half a century forged the steel bones of the skeleton of industry—in war and peace.

Wherever you see Triangle B—on the crankshaft of a great truck—on a drop hammer—on thousands of great drop forgings all over the world—on hand tools made for satisfaction and service—remember that mark means: "Rely on me. I am made as well as I can be made. I shall not fail."

(C) 1918 Billings & Spencer Co.

B

The BILLINGS & SPENCER CO.

HARTFORD, CONN.

"The First Commercial Drop-Forging Plant in America"

Forgings—Hand Tools—Drop Hammers

DUPLEX TRUCKS

BUILT FOR BUSINESS

IN a run from Los Angeles to El Centro via San Diego with a 3060 pound load, it made 267 miles in 8 hours 26 minutes—an average speed of 34 miles per hour. It went the full distance without a stop and the speed limit was observed in all towns in transit.

Another Limited running from New Orleans to Baton Rouge, 124.6 miles, carrying 3750 pounds, made the distance in 6 hours, 55 minutes running time.

The Only Motor Truck With All These New Features In It

Read These Features—Think What They Mean—and You Will Agree That Here is a Truck That a Dealer Can Really Sell In An Honest Way

THE truck business, as you know, is right now passing through a formative period. Out of it will evolve new standards and a better conception of value on the part of the truck user.

Today, as a result of these changes, motor trucks are being scrutinized more carefully than they ever have been before.

Dealers and dealer's methods of doing business, and truck manufacturer's methods of doing business are being weighed in the balance.

Everything about the Duplex organization—the trucks themselves—the distributors and dealers—all are sound and responsible—and because of this inherent soundness, the Duplex Truck Company and the Duplex dealers are going to find themselves in a stronger position than ever before when the market again steadies down to easy buying.

Take this Duplex Limited, for example, and go over its points to yourself again and you will more strongly than ever convince yourself that the Limited absolutely is one of the soundest buys on the market, if not *the* soundest.

The Limited is not merely a speed truck—it is a strong, rugged business man's truck built to carry 3000 to 5000 pounds. It gets its speed from motor power—not from gear ratio. Built and designed for pneumatic tires—standard tread—it takes roads as they come and averages express train speed.

From every angle of mechanical excellence, honesty of construction and fitness for purpose, this Duplex Limited exactly fits in with the present day demand among enlightened truck users and it features exactly those qualities which more and more truck buyers are going to use as standard.

There will never again be as many trucks sold on a free and easy basis as there have been—and the more people there are who come to a sound practical buying basis, the more people there are who will be interested in the Duplex Limited.

Right now is the time to lay the corner stone—to build up and strengthen the foundations upon which future prosperity must be built.

Good Will is an easy word to say—but it is not so easy to build a Good Will.

Never forget that the Good Will of the Duplex Truck Company and of the Duplex dealers as a whole is one of the most valuable and most respected in the whole truck industry.

There never was a time when the name "Duplex" on a truck meant so much as it does today to the users, to the dealers and to us. Now is the time to keep going.

DUPLEX FOR BUSINESS

Duplex Truck Company

Lansing · Michigan

One of the Oldest and Most Successful Truck Companies in America

Strom Bearings Carry Heavy Loads

THIS combination of Strom angular contact and radial bearings shows one method of carrying the heavy loads in motor truck worm gears.

Two large angular contact bearings at one end of the worm shaft take care of the heavy thrust loads in either direction.

On the worm gear the angular contact bearings take the thrust loads. The radial bearing acts as a guide.

The high quality of Strom bearings insures maximum performance under all conditions.

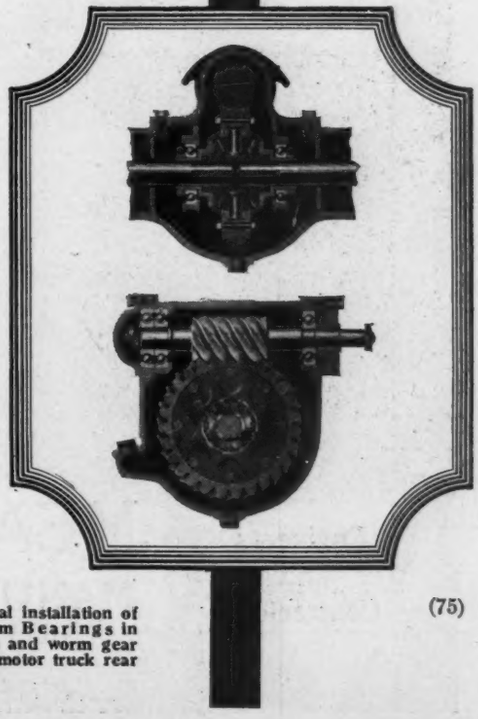
Strom engineers will help choose the mounting best suited to solve your bearing problem.

U. S. BALL BEARING MFG. CO.

(Conrad Patent Licensee)

4542 Palmer Street Chicago, Illinois

Strom BEARINGS



Typical installation of Strom Bearings in worm and worm gear of a motor truck rear axle.

(75)

MEAD-MORRISON SERVICE

LIFTS THE LOAD OF INDUSTRY

Each piece of material handling equipment turned out by Mead-Morrison Engineers has proven itself not only remarkable for the ease with which it performs difficult work and saves time and money—but also for the gratifying way in which it maintains a steady average of accomplishment.

MEAD-MORRISON
Under-Slung
TRUCK WINCH

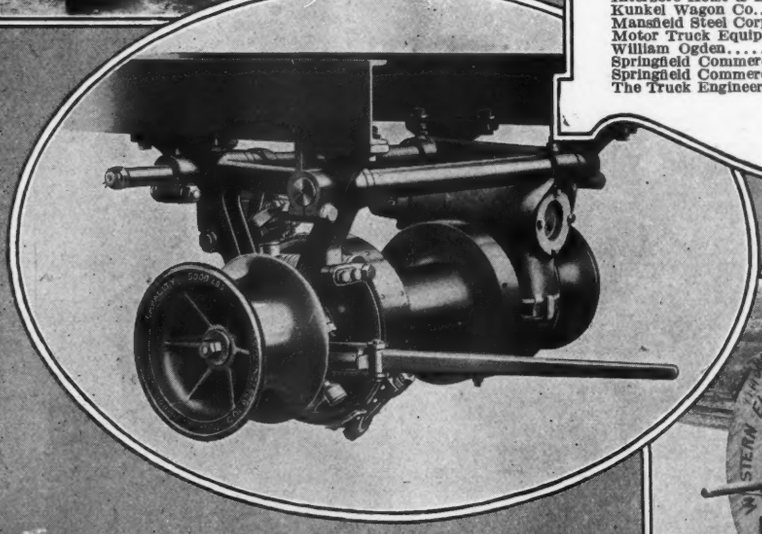
The under-slung Winch—the latest Mead-Morrison product—is typical of Mead-Morrison ingenuity and efficiency.

It fills a long-felt want among telephone companies, street railways and logging camps. Instead of being placed on the floor of the truck it is attached to the rear where it is easily accessible for work of the sort done by the above named industries.

Write for literature

Distributors:

Auto Truck Equipment Co.	Pittsburgh, Pa.
Edward R. Bacon Co.	San Francisco, Cal.
Horizontal Hoist Co.	Chicago, Ill.
Hummel Mfg. Co.	St. Louis, Mo.
Interboro Hoist & Body Co.	Brooklyn, N. Y.
Kunkel Wagon Co.	Baltimore, Md.
Mansfield Steel Corp.	Detroit, Mich.
Motor Truck Equipment Co.	Philadelphia, Pa.
William Ogden	Indianapolis, Ind.
Springfield Commercial Body Co.	Springfield, Mass.
Springfield Commercial Body Co.	Cambridge, Mass.
The Truck Engineering Co.	Cleveland, Ohio

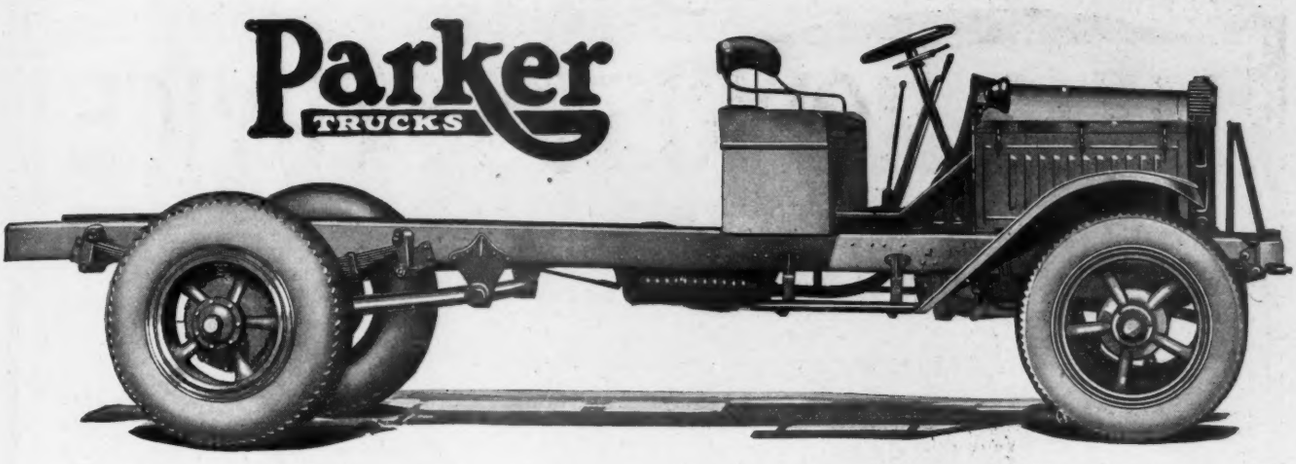


REGISTERED IN U.S. PATENT OFFICE M M C M

Engineers and Contractors

MEAD-MORRISON MANUFACTURING COMPANY
1022 Prescott St., East Boston, Mass.

Coal Handling and Hoisting Machinery



You must sell trucks now the way truck buyers want to buy

The time is gone when truck buyers are induced and influenced by paid publicity popularity and high sounding selling talk.

Today truck buyers know what to look for; they have learned their lesson; experience has taught them what constitute truck value—where a truck must stand up, and where trucks generally fall down.

Truck buyers are buying Parkers because of Parker higher standards and built in dependability, and the indefinite time and mileage guarantee that goes with every Parker sold.

Truck buyers appreciate what the Parker is made of and how it is made—and they realize that the Parker *no limit* guarantee safe-guards their truck investment for the life of the truck.

They are not taking chances any more. And they know they take no chance with the Parker. The Parker is the kind of better truck that buyers are now looking for. For that reason alone, the Parker is the truck to sell.

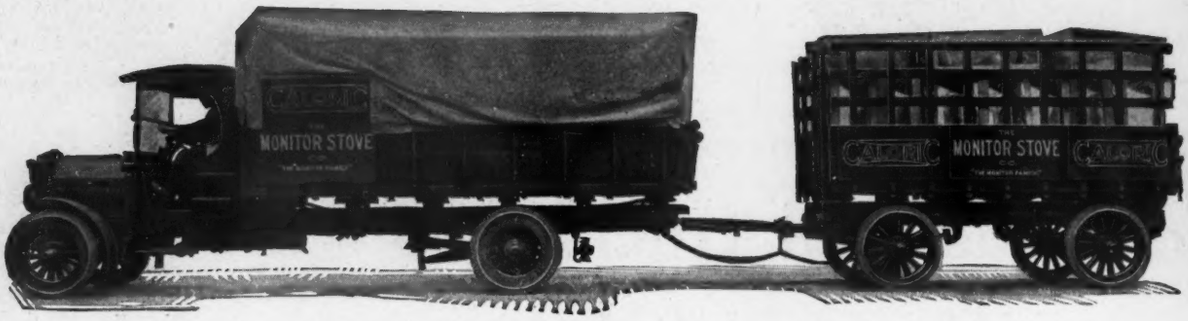
If you are *our kind of dealer*—as substantial in higher standards as are the Parker truck and this organization, we want you to have the Parker Dealership in your territory—and you want us, for the present profits that are certain, and the permanent future success you are assured with the Parker and its policy.

So write now—if no Parker dealer is in your locality—get the new fully descriptive-illustrated Parker catalog, and the details of our dealership arrangement. *Write now!*

Parker MOTOR TRUCK Company, Milwaukee, Wis., U.S.A.

Trailmobile

Trade-Mark Reg. U. S. Patent Office



Good roads are preserved by reducing the load carried on each wheel.

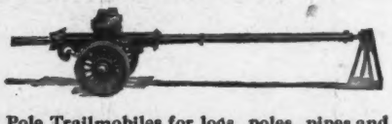
Sell Trailmobile Economy!

THIS IS the time to sell Trailmobiles! Economy is the best of all arguments in appealing to business men faced with the necessity of reducing production costs.

Semi-Trailmobiles for use with short wheel-base trucks are equipped with an exclusive fifth-wheel mechanism which makes coupling automatic. They are made in 2½ ton, 4 ton, 6 ton and 10 ton sizes. This is ideal equipment for city hauling.

Light four-wheeled Trailmobile of 1,250 lbs., ¾-ton and 1-ton capacities are used with passenger cars or light trucks. Lumber dealers, farmers and buyers of farm produce do all their hauling with them and they are used in many other businesses, as a rapid and efficient means of delivery.

Heavy-duty Four-wheeled Trailmobiles for use behind trucks of the usual wheel-base are made in 1½ ton capacity one-way, 2 ton, 3½ ton and 5 ton capacities one-way and reversible.



Pole Trailmobiles for logs, poles, pipes and loads of great length are made with adjustable chock blocks and other important mechanical features in 1½-ton and 3 ton capacities. In each case the truck carries an equal load.

Trailmobiles mean big economies because they double truck capacity; require no drivers; and can be loaded in the absence of the truck reducing idle standing time. They double truck effectiveness at a very slight increase in operating cost.

The Trailmobile line is complete—and it is a thoroughly high-grade well designed line of trailers. The name is established and the dealers are supported by strong advertising.

The profit margin is the same as on the most desirable lines of trucks. The stock that must be carried is small and the investment moderate. On account of the limited number of wearing parts little service is required.

The Trailmobile will increase the truck dealer's volume when he most needs additional business. *Write for all the facts.*

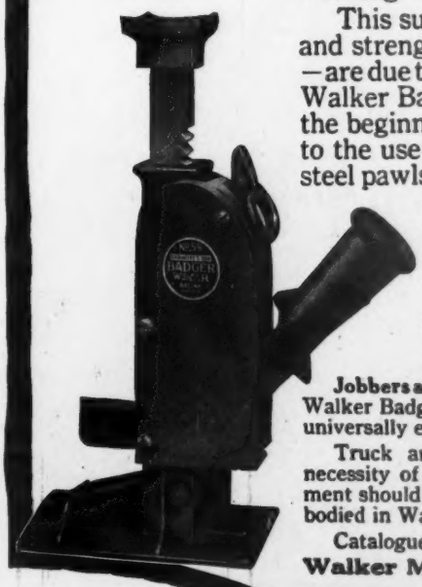
The Trailmobile Company

2901 Robertson Ave., Oakley **Cincinnati, Ohio**

Happy, Hurry-Up, Action!

When a Walker Badger Truck Jack sets its sturdy shoulders under an axle—things move—and move *quick*. There is a true American spirit of "let's go" in action of a Walker Badger Jack.

It asks no odds. It isn't choicy about *where* it goes into operation. Merely give it working room—and it's ready and eager for business.

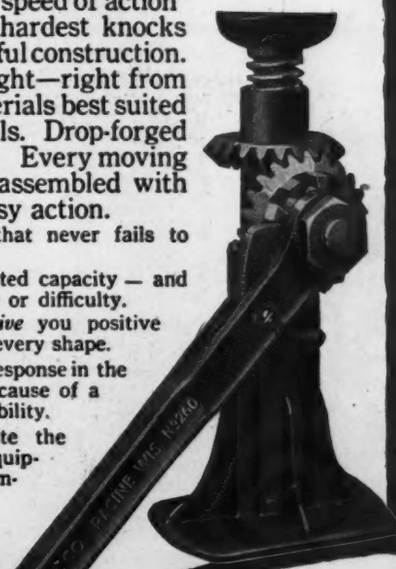


This surity of action—ease of action—speed of action and strength that never crumples under hardest knocks—are due to superiority of design and skillful construction. Walker Badger Truck Jacks are made right—right from the beginning. Each section built of materials best suited to the use—hardiest, longest lived metals. Drop-forged steel pawls—of greatest wearing quality. Every moving part machined in jigs — and assembled with accuracy which gives free, easy action.

Equipped with automatic lock — that never fails to lock and *stay* locked.

Factory tested to lift more than rated capacity — and guaranteed to do so without breakage or difficulty.

Jacks of proven worth, which *give* you positive protection against jacking trouble in every shape.



Jobbers and Dealers find quick sales and profit response in the Walker Badger line—"A Jack for every Job"—because of a universally established reputation of absolute reliability.

Truck and car manufacturers who appreciate the necessity of furnishing thoroughly meritorious equipment should investigate the many superiorities embodied in Walker Badger construction.

Catalogue upon request.

Walker Mfg. Co. **Racine, Wis.**

WALKER BADGER TRUCK JACKS

MIDWEST
TRUCK and TRACTOR ENGINE

Compare the Mechanical Volumetric And Thermal Efficiency of This Engine With Any Other Engine

EVERY claim we have made for the Midwest Engine has been *proved* by manufacturers in gruelling tests.

They have proved that this engine delivers a performance equal—and in most cases superior—to engines of greater displacement.

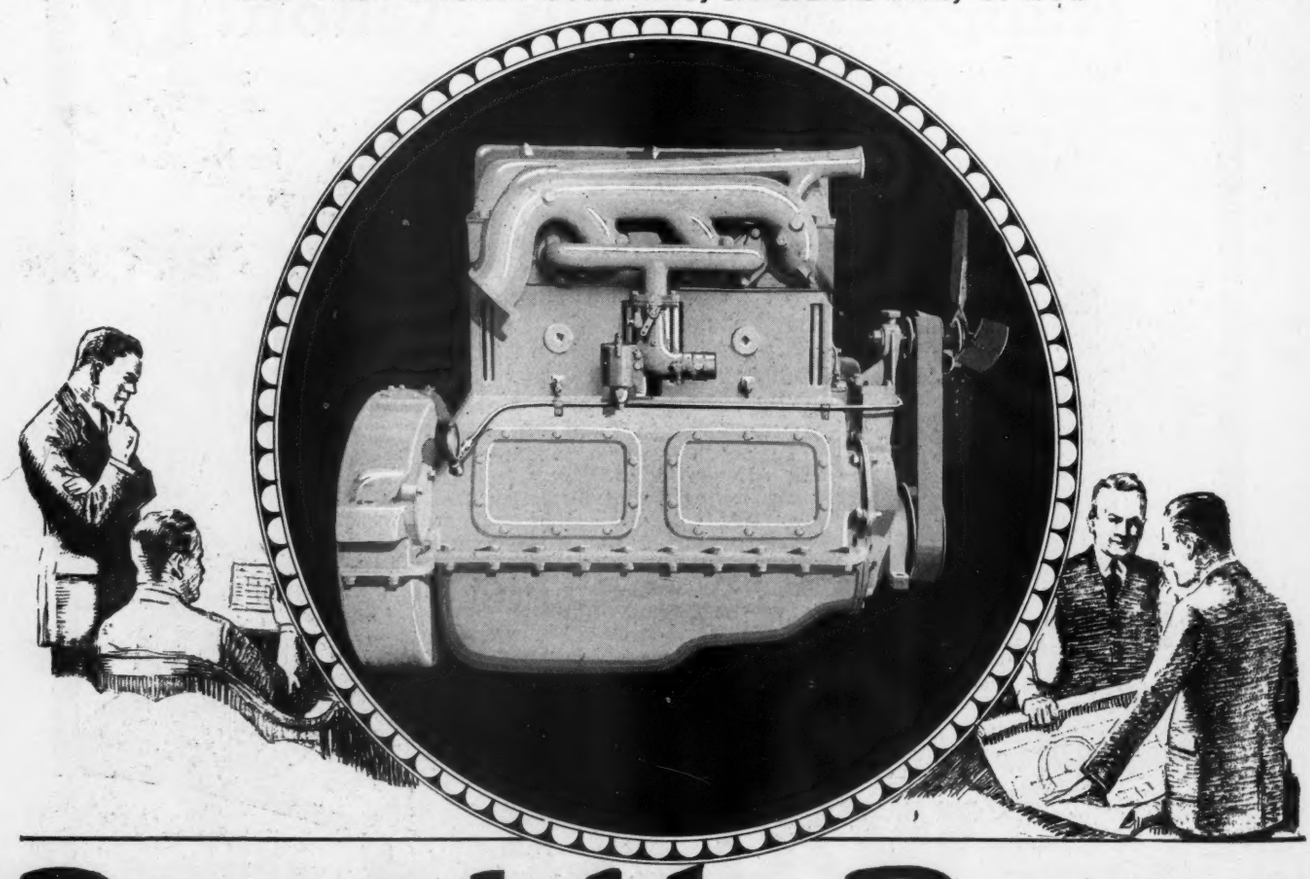
In fact, they have found what they have wanted in an engine—a performance and service ability able to meet the present day demand for greater average truck speed. They have found that it is not bore and stroke which counts, but performance—performance that means a high speed, safe, economical and dependable *driving* effort that will be the means of selling trucks on a *Performance Basis.*

We have prepared complete data on the performance of the Midwest truck engine—its mechanical, thermal and volumetric efficiency—which we will gladly send you—and we want you to compare it with like data *on any other engine on the market.*

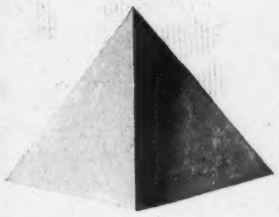
You will readily see why our manufacturing capacity is being rapidly absorbed by wide awake truck manufacturers.

We suggest you write for this data. Our Sales Engineers are at your service.

MIDWEST ENGINE COMPANY, INDIANAPOLIS, U. S. A.



Dependable Power



The
Pyramid of Service

This is the new symbol adopted by the Service Motor Truck Company which will henceforth distinguish all Service Motor Trucks on the highways of the nation. Look for it on the radiator.

IT STANDS FOR—a quality truck in which the highest standards of automotive engineering practice are rigidly followed.

IT STANDS FOR—advanced thought and progressiveness which is today crystallized into SCIENTIFIC CUSHIONING, one of the most important developments in truck building.

IT STANDS FOR—Service in every sense of the word; the service guaranteed by inherent quality; the service guaranteed by the finest possible construction; the service guaranteed by a maintenance department which is the most complete, we believe, in America.

Scientific Cushioning

A Complete Success
A Big Selling Feature

THE SUCCESS of the Service method of SCIENTIFIC CUSHIONING as a big selling feature for dealers is unmistakable and complete.

By means of a scientific system of shock insulation the entire mechanism of the Service Motor Truck is scientifically cushioned. Thus the severe strains and wrenchings due to the shifting of load-weights are counteracted.

The ruinous shocks and terrific stresses communicated through the axles to the transmission and engine are absorbed. Likewise the impacts caused by the loaded truck meeting bumps and ruts in the road; the shocks caused by the sudden application of brakes—of backing into curbs, etc., are softened by a yielding action.

Service Motor Trucks, protected by SCIENTIFIC CUSHIONING are made in 7 models and 80 combinations of speed, power and capacity—giving dealers a complete line.

Service features are being continuously presented to the American public through powerful national advertising. Dealers who can give service to their customers and properly represent us, should write for full information.

SERVICE MOTOR TRUCK COMPANY
Wabash, Indiana, U. S. A.

Service
MOTOR TRUCKS
With the Red Pyramid *on the Radiator*

THE flange idea, applied exclusively by Bower to bearing design, is essentially the same principle that introduced a new element of safety into rail travel.

It has been accepted for years as the highest standard of bearing practice by the better automobile makers.

BOWER
ROLLER BEARING CO.
Detroit Michigan

Exclusive Bower Features

Separate bearing surfaces for load and thrust. Parallel raceways. Self-aligning. Never need adjusting. Does not develop end-thrust under loads. Will not bind or end-slip.

BOWER SAVES POWER

"the truck of continuous service"

Maccar

Ten Dollars Expense in Three Years

"THE total upkeep expense on our 2½ ton Maccar Truck is $10.00. In its three years' service, the only repair needed has been the grinding of the valves. It was two years old when put into trucking service to Boston, and in 6 months made 20 round trips, besides handling local jobs. It has carried up to 7 tons."

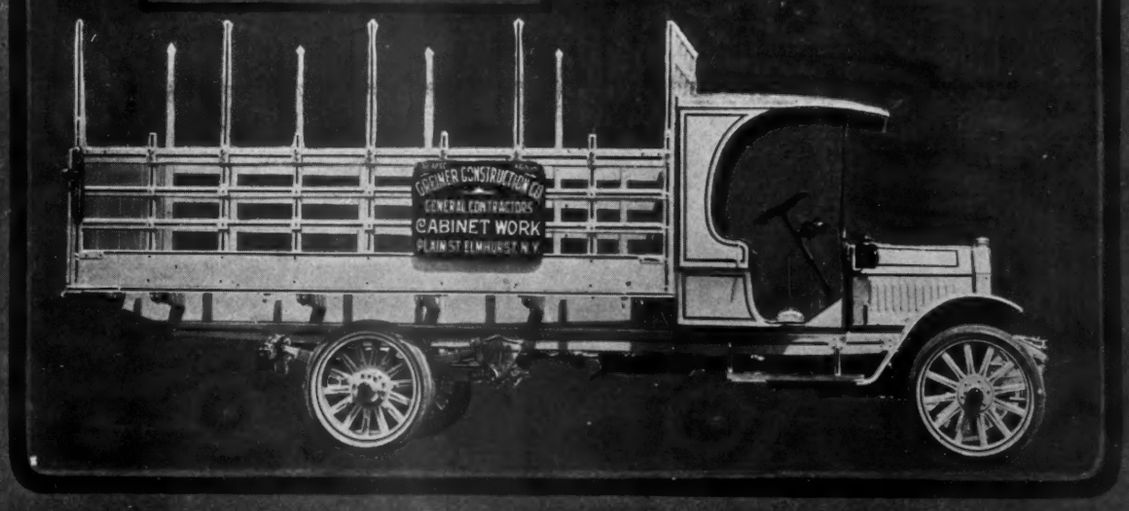
Griener Construction Co.
Elmhurst, L. I.

DEALERS: Write for the Maccar Proposition

Models: 1 to 5½ tons carrying capacity.

Maccar Truck Co.
Scranton, Pa.

Maccar's Demountable Power Plant which can be changed in 30 minutes includes radiator, motor, clutch, dash, foot pedals, steering gear, and transmission.



How Walter, the Inventor, combined the Engineering Genius of France & America in a Motor Truck

As a pioneer in automotive engineering, Mr. William Walter has originated many of the greatest improvements in motor truck design.

The genius of Mr. Walter has developed during the last 15 years, departures which have paved the way to the masterful Walter Motor Truck of today, with exclusive features such as the *Walter Suspended Drive* and *Locking Differential*

Distinctive engineering features, protected by basic patents have perfected a motor truck of such dominating mechanical excellence, as to forecast its leadership in the heavy-duty Motor Truck field.

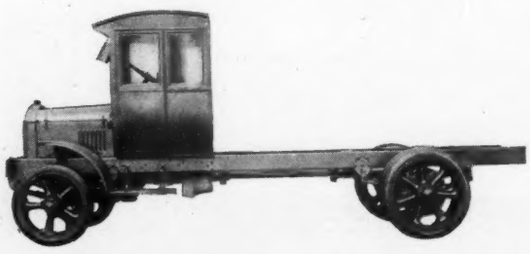
Since the first Walter Truck went into service 10 years ago, it has made enviable records for strength, economy and durability. Many of these first Walter Trucks are still operating efficiently in the service of the original owners—a convincing monument to Walter construction.

WALTER SALES COMPANY

Builders of 3 Ton and 5 Ton Capacity Trucks

605 Fifth Avenue, New York

The Walter Franchise offers to dealers the opportunity to sell the best trade, on a permanent basis, offering broad protection, large profits and the benefit of close sales co-operation. You owe it to yourself to write for details.



Custom Built

WALTER

Motor Trucks of Permanence

ZENITH

CARBURETOR

Another Zenith Achievement

When on August 10th and 11th off the Isle of Wight, "Miss America," driven by her owner, Car Wood of Detroit, won the Harmsworth Trophy, her engines were Zenith-equipped.

Your car or truck should be equipped with the dependable Zenith.

ZENITH CARBURETOR COMPANY

New York DETROIT Chicago

European Factories—London, England; Lyons, France; Turin, Italy

A MOTOR TRUCK OF DISTINCTION

In the construction of Armleder Motor Trucks only the best known high-grade units are used. These alone, however, do not make a good truck. They only make a good truck possible. The truck must be properly engineered, designed and constructed.

Armleder Motor Trucks are an achievement in automotive engineering. They embody many patented and exclusive features which other trucks do not and cannot have. There are the wonderful Armleder springs, the sturdy frame which will not shear out of square, radius rods which eliminate all driving strains from the springs and end thrusts from the propeller shafts, radiators which are practically leak proof, and many other features which are very vital to a motor truck.

It is these features combined with the finest material and workmanship, that raise the Armleder from the ordinary good motor truck to one that stands apart from and above all others.

The O. Armleder Company

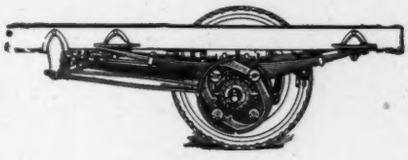
ARMLEDER MOTOR

They add to the efficiency of the truck and its value to you.

Buy an Armleder and be sure of the maximum service throughout the years with the lowest cost of operation and maintenance.

A TRUCK ON WHICH TO BUILD A FUTURE

THE SPRINGS are only one of the many patented features used exclusively in Armleder Motor Trucks. There are no shackles, nor shackle bolts; about 48 wearing parts are eliminated; each leaf is made of triple heat-treated Vanadium steel; pads between springs and axles are machined, set in lead, air and water tight; held by strong U-bar clips, they will not loosen; they are 64 inches long and shorten 16 to 20 inches under load; without load weight rests on tips of springs; with load weight rests 8 to 10 inches from the ends of the springs; they ride like touring cars; reduce gasoline and upkeep costs; increase life of tires and truck.



1, 2½ and 3½ Ton Models. Worm Drive

Cincinnati, Ohio, U.S.A.

ARMLEDER TRUCKS

peak loads

Ace trucks traveled on their own power from the factory to the Atlantic Coast during the snow storms of last winter, and beat the freight car shortage by delivering their loads in all weathers over all grades.

Ace trucks pulled out other trucks, took fire engines and hook and ladder wagons to fires through almost impossible drifts and made an unmatched winter transportation record.

Ace trucks in 1½ and 2½ ton capacity are ready for immediate delivery. We make in our own plant any style of wood body you may require.

PRICES, CHASSIS ONLY

1½ Ton . . $2750.00 2½ Ton . . $3450.00

A full range of special equipment, extra

Automotive Products Corp. Export Dept.
WOOLWORTH BLDG., NEW YORK CITY

Cable Address, Autoprodco, New York

Ace
MOTOR TRUCKS
IMMEDIATE DELIVERY

Ace

The AMERICAN MOTOR TRUCK COMPANY
NEWARK OHIO.

EQUIP any truck with a New Stromberg Carburetor—and here's what you get whenever or wherever that truck goes into action—

MORE POWER
MORE SPEED
MORE MILEAGE

Which means just this—you can handle heavier loads, thereby reducing the cost per ton of haulage. And you can do it in less time on less fuel. The result is three savings right where economy counts most—Time—Tonnage—Mileage.

Definite proof of that has put the New Stromberg Carburetor on 41% of all listed truck models, while day after day duplication of perfect performance *keeps* it there.

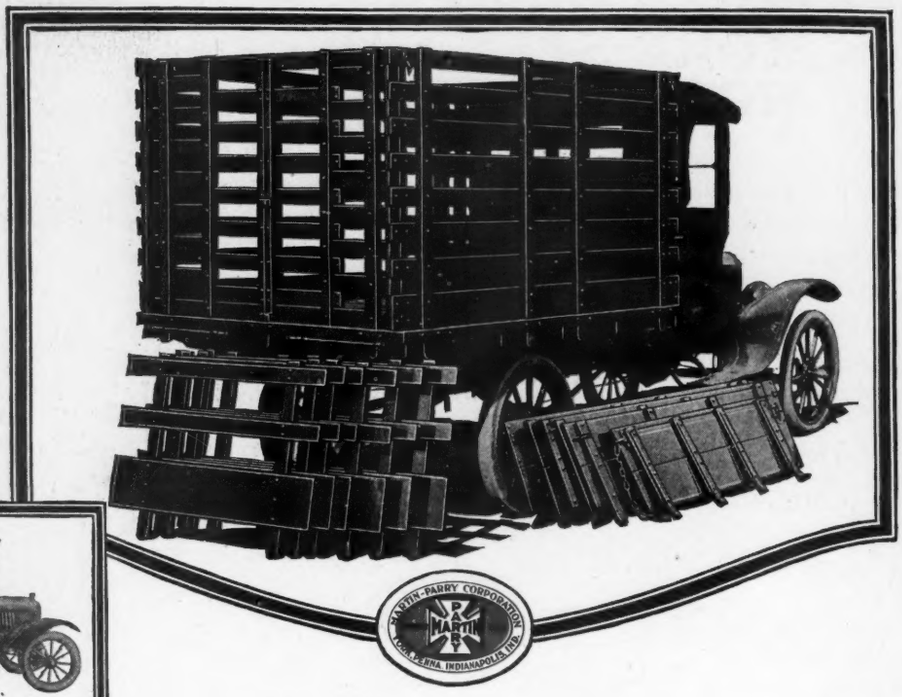
Write today for descriptive matter and be sure to give name, year and model of your truck.

Stromberg Motor Devices Co.
Dept. 1036
64 E. 25th Street
Chicago

New STROMBERG Does it!
CARBURETOR

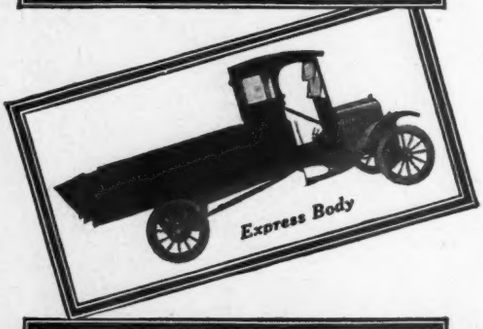
Martin-Parry Commercial Bodies

Illustration at right shows complete equipment of Martin-Parry Multi-Service Bodies for Ford Trucks, with Stock Body mounted on platform and Stake and Express Bodies grouped around truck.

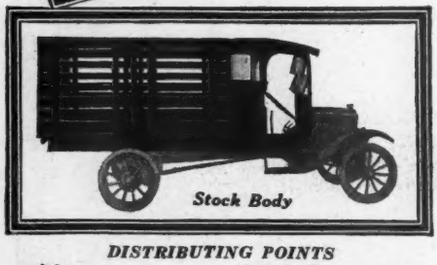


THREE Types of Bodies Interchangeable on ONE Platform.

Stake Body



Express Body



Stock Body

DISTRIBUTING POINTS

Atlanta	Martin-Parry Corp.
Boston	Martin-Parry Corp.
Buffalo	Martin-Parry Corp.
Chicago	Martin-Parry Corp.
Denver	Auto Equipment Co.
Detroit	Schoof-Gracey Body Co.
Duluth	Foster Motor Co.
El Paso	Tri State Access. Corp.
Kansas City	Henry Seested
Memphis	Universal Motor Car Co.
Milwaukee	Wis. Body & Sales Co.
Minneapolis	Northwest Body Co.
Oklahoma City	H. N. Knight Sup. Co.
Pittsburgh	Pittsburgh Com. Body Co.
Richmond, Va.	Benj. T. Crump Co.
St. Louis	Bailey Auto Body Sales Co.
San Francisco	Flynn & Collins
Seattle	Commercial Body Co.
Spokane, Wash.	Universal Auto Co.

Equip Your Ford Trucks With Multi-Service Bodies

DEALERS are highly successful in selling Martin-Parry Multi-Service Bodies because they best meet *all* the requirements of hauling with the Ford Truck.

The sturdy platform on which the three interchangeable bodies are used is ideal for hauling baled hay or straw, grain or cement in sacks, fence posts, etc.

With the express panels in place you have a good body for carrying grain, gravel, sand, coal, ice and scores of other loads.

The six stake sections make an excellent body for transfer work and store delivery, as well as for use in hauling produce in crates, boxes or barrels.

With the 48 inch racks mounted you can haul stock of any kind—hogs, sheep or cattle.

These bodies are specially built for Ford Truck Chasses. Selling them on your trucks brings you new and profitable business. Write us for complete specifications and prices.

Increased Production—Immediate Shipments

Martin-Parry Corporation

The Largest Commercial Body Builders in the World

York, Penna. —*Main Offices and Factories*— **Indianapolis**

Factors of Safety

In Spring Making — In Spring Buying

A World's Record in Production—And What It Means to You

More than 2,000 tons of Detroit Springs for trucks and pleasure cars are made each month in this plant.

This, to the best of our belief, is the world's record production of motor car springs.

When the buildings now under erection are completed, more than 3,000 tons a month can be produced.

This tremendous tonnage is the result of 16 years of successfully meeting the requirements of American truck and pleasure car builders.

It reflects their confidence in

—our facilities and equipment for manufacture.

—our ability to ship material promptly.

—our knowledge of how to make high grade springs.

—our business and sales policies which have led to friendly relationships over a long period of years.

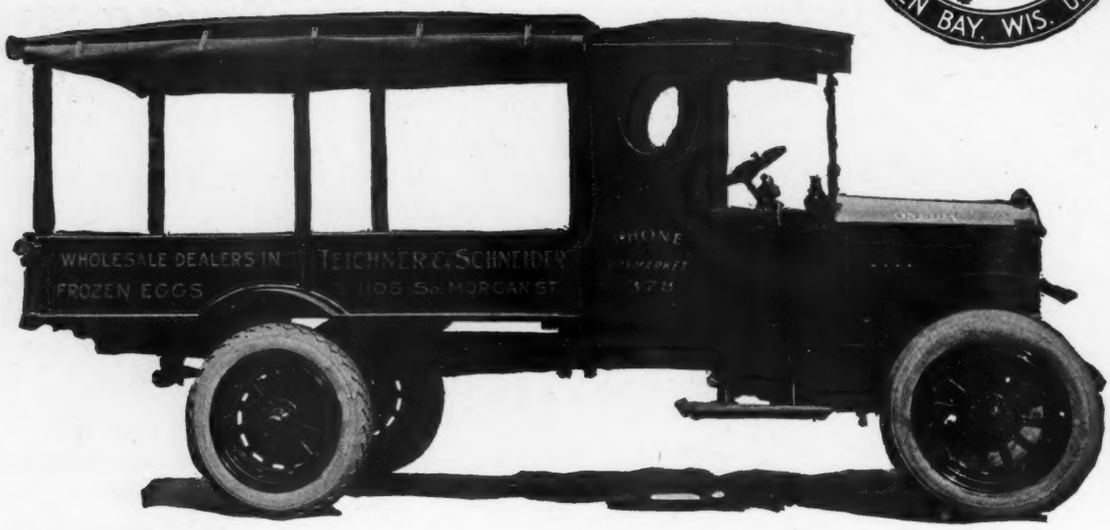
—our financial strength which gives us the power to buy material in large quantities, with consequent saving.

These are Factors of Safety to *you* as well, in buying the springs for your truck or car.

DETROIT STEEL PRODUCTS CO.

2250 East Grand Boulevard Detroit, U. S. A.

ONEIDA MOTOR TRUCK CO
ONEIDA
GREEN BAY, WIS. U.S.A.



Gasoline and Electric Trucks

for every hauling requirement

We are the only manufacturers of both gasoline and electric trucks for all hauling requirements.

Oneida is able to recommend impartially which type of truck is best suited to your needs, the *right* truck for the job.

Designed and built to stand the terrific strains of hauling heavy loads over rough roads at high rates of speed, the Oneida gasoline trucks combine the speed of motor cars and the bulldog tenacity to carry weighty freight to its destination.

Five husky models of gasoline trucks provide ideal equipment for long distance hauling. These trucks are daily establishing records for extraordinary performance. Some of the Oneida long run records have stood untouched since they were made. Our record run, under capacity load, made from our factory at Green Bay, Wisconsin, to New York City, 1,451 miles in 62 hours, is nearly two days faster than any other similar record.

Our electric models, equipped with the unique Oneida two-gear drive, are unequaled for economy and reliability in city hauling and delivery work.

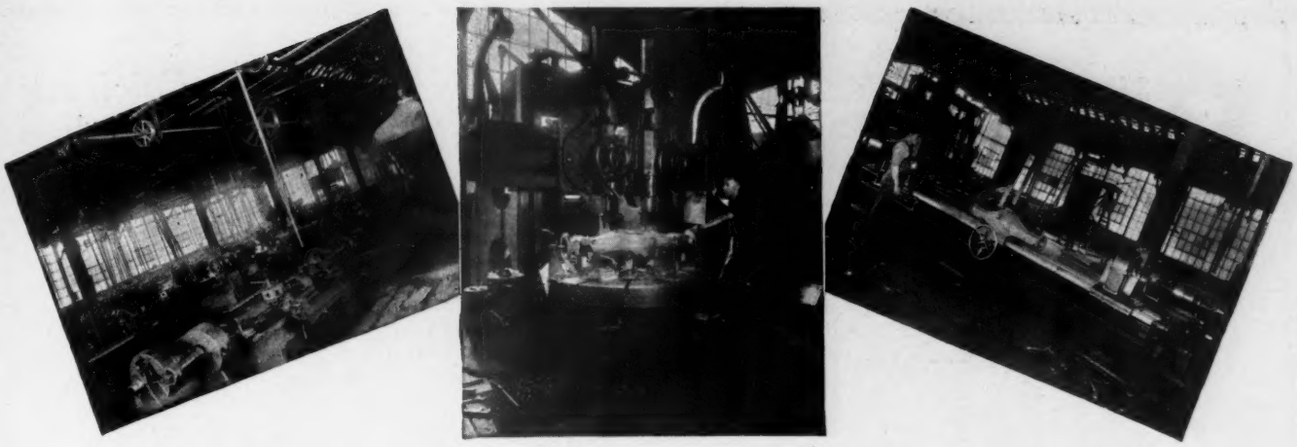
Literature, sent on request, will tell you more about the "engineering reasons" why Oneidas do a hard day's work *better. And why the complete Oneida line offers unusual advantages to the dealer.*

DEALERS—Reliable, thoroughly established dealers will find it to their interest to write us regarding the possibility of their handling Oneida Motor Trucks

ONEIDA MOTOR TRUCK COMPANY **1208 Broadway** **GREEN BAY, WIS.**

ONEIDA

ELECTRIC TRUCKS :: GASOLINE TRUCKS



Vulcan Motor Axles Are in Production

Three months ago announcement was made of the Vulcan Motor Axle Corporation.

At that time a factory had been acquired and machinery purchased.

It is a pleasure to announce that this large and modernly equipped factory is today in operation.

It is not surprising that these rapid strides have been made. The personnel of the Corporation is composed of men who have been in constant successful association with one another for many years as principals in one of the biggest producing axle concerns. These men know the axle business in such a way as to eliminate any lost motion in manufacturing.

Moreover, these men are intensely gratified at the reception already accorded the Vulcan Axle Motor Corporation. The announcement of an axle concern whose primary functions would be to build better axles, form a dependable source of axle supply and carry on business with the utmost of co-operation and courtesy has found an instant appeal among the users of this equipment.

Vulcan Motor Axle Corporation
Detroit, Michigan

OFFICERS:

FREDERICK C. GILBERT
President and Treasurer

C. C. MILLER
Vice-President

SIDNEY C. LOVE
Vice-President, Sales

JOHN T. HANLON
Secretary

R. B. WEAVER
Vice-President, Production

R. B. BEECHLER
Chief Engineer

VEHISOTE:

(Trade-Mark)

Efficiency
General Satisfaction
Economy

VEHISOTE SIDE PANELS

Guaranteed not to split, crack or check. Think what this guarantee means to YOU!

Vehisote, like steel, is made by a fluxing process in which all the fibres run together, interlock and interlace so that it becomes all one homogeneous material in which there is no point of separation, no grain as in wood, no laminations as in built-up or stuck-together products. Therefore, it cannot check or split.

It is the nature of wood to split and crack under strain. How is this natural defect to be cured by gluing pieces of wood together?

Wood is wood, has always been and always will be.

THE PANTASOTE COMPANY

11 Broadway, NEW YORK

CHICAGO: Peoples Gas Building **DETROIT: Penobscot Building**

JOBBERS:

The Scovel Iron Store Co., San Francisco, Cal.
Sligo Iron Store Co., St. Louis, Mo.
E. D. Kimball & Co., Chicago
E. C. Kadow & Co., Chicago
C. H. Tiebout & Sons, Brooklyn, N. Y.
N. Langler & Sons, Brooklyn, N. Y.
H. D. Taylor & Co., Buffalo, N. Y.
W. E. Kleine & Co., New York City
H. Hett & Sons, New York City
W. T. Crane Carriage Hardware Co., Newark, N. J.
Gerhab & Ludlam, Philadelphia, Pa.
John C. Hills, Trenton, N. J.
Mossman-Yarnelle Co., Fort Wayne, Ind.
Wm. Stockhoff, Louisville, Ky.
Faeth Iron Company, Kansas City, Mo.
Minneapolis Iron Store Co., Minneapolis, Minn.
Nicholas, Dean & Grigg, St. Paul, Minn.
Shadbolt & Boyd Iron Company, Milwaukee, Wis.

Who is Going to Get the Trailer Business in Your Territory?

You know it is there to get. You know that every time you drive into the country you see more trailers than you ever saw before. You know that you see more trailers coming into use on city streets every day.

But do you know that the trailer business today compares with the trailer business of the next few years like an acorn compares with an oak? Do you know that the demand for trailers is increasing more than 100% faster than the demand for trucks.

We don't ask you to take our word for these facts. Investigate for yourself. Look over the field. Make a few inquiries among your friends who own or operate motor trucks. If they don't know the facts about trailer hauling, simply tell them an Ohio Trailer doubles the capacity of any truck. Tell them the operating expense is practically the same whether a trailer is used with a truck or not.

Then think of the market for Ohio Two-Wheel Automobile Trailers. Think of the hundreds of farmers, stockmen, plumbers, painters, paper hangers, merchants in every line of business who need a two-wheel trailer to haul any load up to one ton, behind any make of touring car or truck.

Somebody is going to get the trailer business in your territory. Somebody is going to make mighty fine profits handling Ohio Trailers this year, bigger profits next year and all the years to come.

The opportunity is yours today. It may be gone tomorrow. Territory is being taken fast. Write or wire for Ohio Trailer Dealer's proposition today. Quick action is needed.

MAIL THIS NOW

THE OHIO MOTOR VEHICLE COMPANY, Cleveland, Ohio
Send full details of your ..... distributor's
or ..... dealer's proposition.
No obligation whatever to me.
Name .....
Address .....

The Ohio Motor Vehicle Company
Nottingham Road, Cleveland, Ohio

TRADEMARK

"Always On the Job"

A Columbian Lightning Hoist attached to a wooden body—One man handles a Five-ton load with ease

—the Hoist

(PATENTED)

THE Columbian Lightning Hoist is in use in every part of the United States; also extensively used in Canada, Mexico, Cuba, Jamaica, Japan and other foreign countries.

It is a time and labor saving device for all concerns who are engaged in the hauling of loose materials such as Coal, Gravel, Sand, Crushed Rocks, Dirt, Refuse, etc. One man can easily handle a five-ton load. Fits any chassis—can be easily attached.

—the Body

THE Columbian All Welded Metal Dump Bed is the latest in dump body construction. Thru the use of this all welded method all rivets are eliminated, making a strong job for durability and hard usage.

Made in two standard models, straight sides and flared sides, with or without endgate.

Write us for illustrated folder No. 69, or

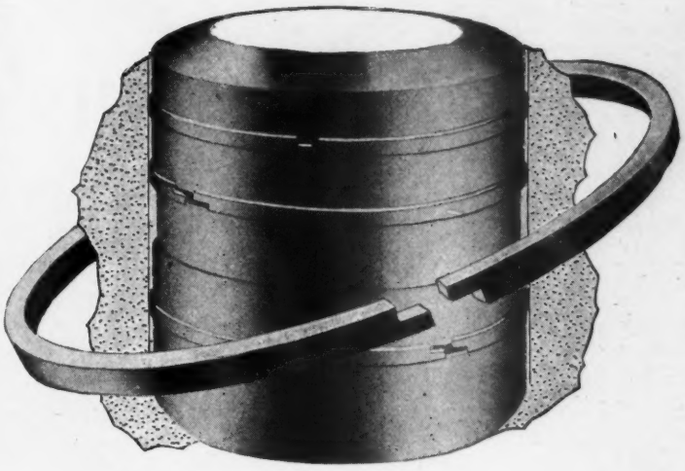
Write Your Nearest Distributor

Davenport Body Co., - Davenport Iowa, 1509-33 Rockingham Road
Hummel Mfg. Co., - St. Louis, Missouri, 3008 La Salle Street
Jules Mechanic - - Pittsburgh, Pa., 248 Croft Street
Giant Motor Truck Co., - Vancouver, B. C., Grandville Pac. Street
Largerquist Car & Auto Co., Des Moines, Ia., 514 West 2nd Street
S. S. Albright, . Sacramento, California, 13th & U Streets
Beard & Co., - Louisville, Kentucky, 418 Keller Building
Blackwell Motor Co., Spokane, Washington, Corner 3rd & Post Streets
Landes & Co., - - Salt Lake, Utah, 2nd. West and South Temple
Jacob H. Press & Sons, 300 Haltsead Street, Chicago, Illinois

COLUMBIAN STEEL TANK CO.

"TANKS FOR THE WORLD"
1519-1625 WEST 12th STREET

"ESTABLISHED IN 1894"
KANSAS CITY, MISSOURI.



They Fit like a Glove

OIL OR GAS CANNOT GET THROUGH

Eco Numethod CONCENTRIC PISTON RINGS

Loss of compression and lack of power due to rings are often the result of rings not being round and so failing to bear against cylinder walls at all points.

From individual castings Numethod rings are machined round by aid of patented devices, and are inspected for roundness. They will maintain compression and prevent continual waste of gasoline and oil.

The accumulation of carbon will be held down to a minimum.

And the difference in cost of Numethod rings is trifling.

Our new booklet is yours for the asking. It is invaluable to garages and repair men, giving points to look for in piston rings as well as a list of ring sizes for all models in tractors, trucks and motorcycles.

Rough Grinding Edges

(Operation No. 2)

ECO RINGS, the "rings of quality," are rough ground to a uniform dimension, and the two sides are made parallel to each other.

ECO MANUFACTURING CO.

53 State Street

Boston, Massachusetts

EFFICIENCY-RELIABILITY-DURABILITY
GARY
SIMPLICITY-TRUCKS-ECONOMY

Make Comparisons

Turn over to "The Motor Truck Specifications" in The Commercial Car Journal, and see for yourself how much larger and better Gary trucks are than other trucks of the same rated capacity—and after you have learned what Gary users know, please note that Gary prices are ***below the average*** of over forty different makes of heavy-duty worm drive trucks.

We have some open territory.

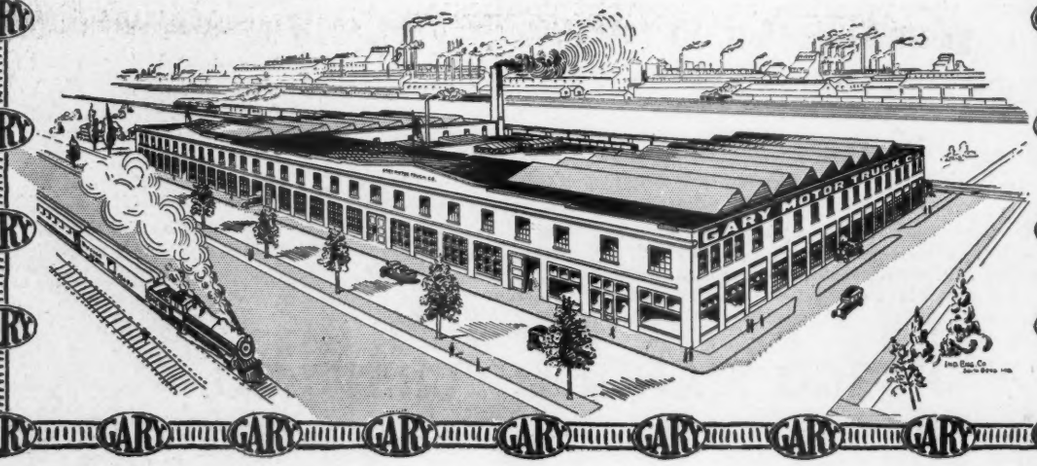
We can make immediate deliveries.

Our proposition to dealers is the most liberal to be had anywhere.

Write or Wire Today

THE GARY MOTOR TRUCK CO., 2301 West 9th Ave., Gary, Ind.

1, 1½, 2½, 3½ and 5 ton. Special Motor Bus. Special Farm Wagon. Special Tractors.

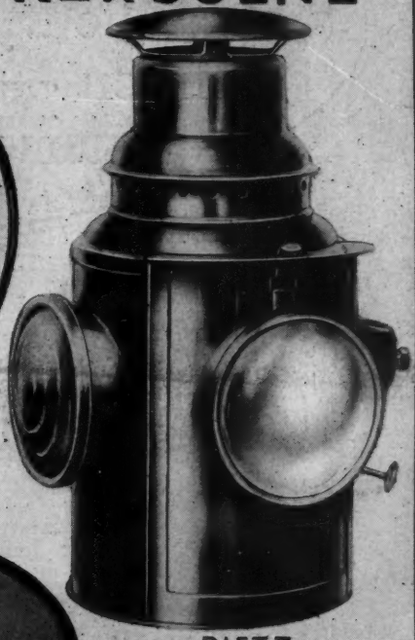


DIETZ MOTOR TAIL LAMPS

THEY BURN KEROSENE

DIETZ CONVOY TAIL LAMP

DIETZ ROYAL TAIL LAMP



DIETZ MONITOR TAIL LAMP

DIETZ LAMPS

LAMPS THAT ONCE LIT STAY LIT

LAMPS THAT COMPLY WITH THE LAW

DIETZ BIG 3 TAIL LAMPS

(For Kerosene)

Different in Construction and Candle Power—Alike in Reliability on the Road

ROYAL TAIL LAMP

Cold Rolled Steel Construction. "Cold Blast" Combustion. 9¾ Inches High. 12 C. Power. White Lens 4⅝ Inches. Ruby Lens 3 Inches. Black Enamel Finish. Used with either Dietz "Champion" or "Royal" Side Lamps.

"MONITOR" TAIL LAMP

Cold Rolled Steel Construction. 9¾ Inches High. 8 C. Power. White Lens 3 Inches. Ruby Lens 3 Inches. Black Enamel Finish. Used with either Dietz "Ironclad" or "Monitor" Side Lamps.

"CONVOY" TAIL LAMP

Cold Rolled Steel Construction. 8¾ Inches High. 7 C. Power. White Lens 3½ Inches. Ruby Lens 3½ Inches. Black Enamel Finish. Used with either Dietz "Convoy" Dash or "Convoy" Side Lamps.

Our New Catalog of Dietz Kerosene Motor Lamps is Just off the Press. Send for a Copy

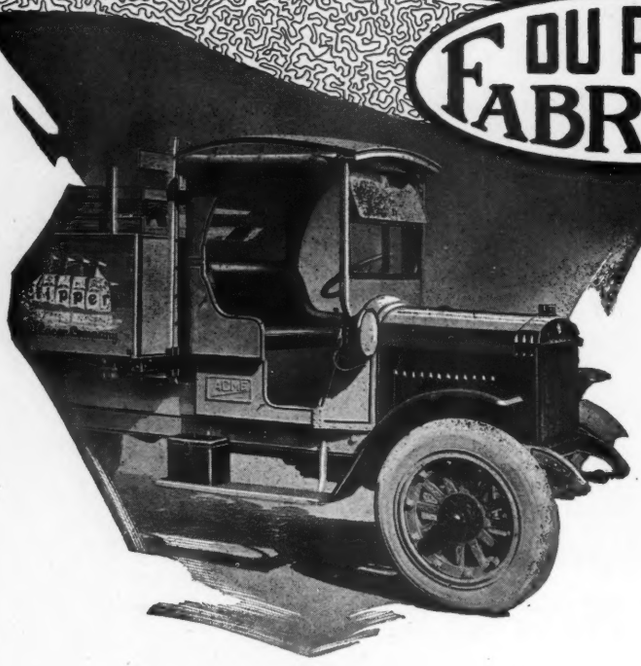
R. E. DIETZ COMPANY

60 Laight Street *Founded 1840* **New York**

JAMES BARNES, Sales Manager Motor Truck Lamp Dept., Carter Building, Rochester, N. Y.

The Fabrikoid process adds beauty and long life to fabrics; some heavy and rugged, others dainty as linen — all pliable, scuff-proof, stain-proof and water-proof.

DU PONT FABRIKOID



—a heavy-duty upholstery material

THERE'S no upholstery material made that can beat Fabrikoid for heavy-duty.

It is rugged, yet so pliable that the seat is comfortable—and it remains so, for Fabrikoid never gets soggy even under repeated wettings.

Fabrikoid is scuff-proof; grease and dirt will not stain it; it may be kept clean by washing with soap and water.

Fleet owners favor Fabrikoid because of its economy in first cost and because renewals are usually unnecessary.

Write for samples and complete information.

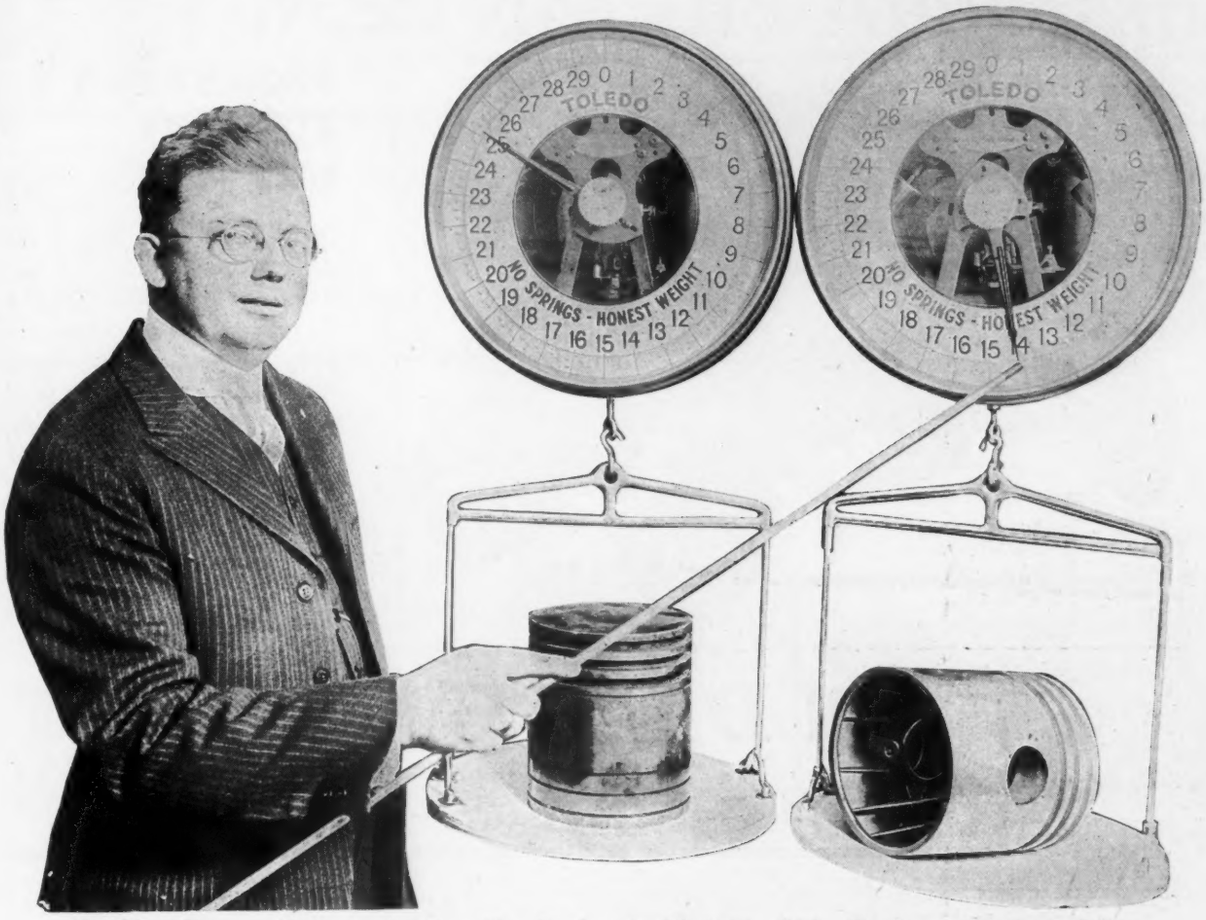
DU PONT FABRIKOID CO.
WILMINGTON, DELAWARE

Branch Offices:

21 E. 40th Street . .	New York City
Dime Bank Building .	Detroit, Mich.
Gugle Building . .	Columbus, Ohio
McCormick Building .	Chicago, Ill.
Merchants Bank Building	Indianapolis, Ind.
Harvey Building . .	Boston, Mass.
Chronicle Building . .	San Francisco, Cal.

Plant: Newburgh, N. Y.

FABRIKOID



Stanley Turner Demonstrating the Saving in Weight of the De Luxe 7½ Inch Piston

More Miles—Less Gasoline

WITH

DELUXE
LIGHT WEIGHT GREY IRON PISTON ©
"The Successful Light Weight Piston"

"Look inside, you can't go wrong"

Order from your nearest dealer listed in (RED) AUTOMOBILE TRADE DIRECTORY and CHILTON AUTOMOBILE DIRECTORY.

Truck motors equipped with De Luxe Pistons develop more power on less gas.

It takes less gasoline to propel a piston weighing 14 pounds than one weighing 25 pounds and as DE LUXE light weight, grey iron pistons are

40% TO 50% LIGHTER WEIGHT THAN FACTORY CAST IRON PISTONS

they obviously make a big saving in fuel.

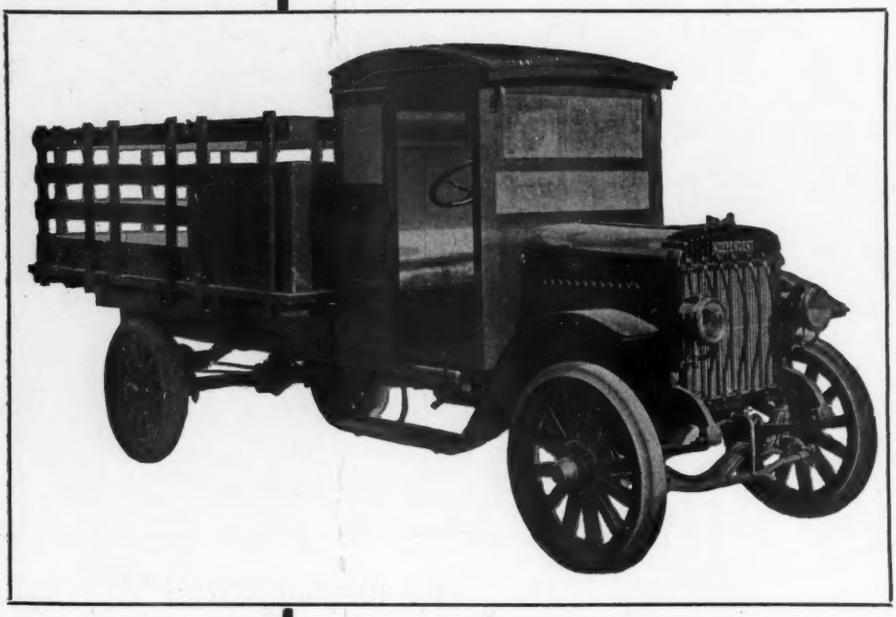
De Luxe Pistons cut down the operating expense of a commercial car and increase its earning capacity.

Ask any good automobile mechanic about De Luxe Pistons.

Manufactured by

CLARK-TURNER PISTON CO.

1246 South Los Angeles Street Los Angeles, California



Measures UP TO Every Claim

Independent dealers never overstate the facts, because Independent Trucks represent the superlative in performance. They are equal to any task, giving dependable service over a period of years considerably longer than the average. Send for our literature—note the parts and general excellence of construction. Let us tell you how this big organization will place its unlimited resources behind the right type of dealer.

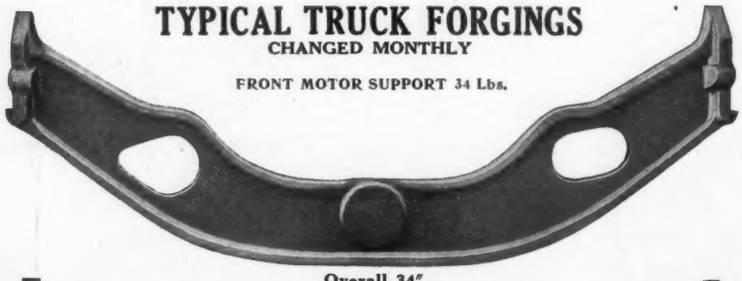
INDEPENDENT
1-1½-2 TON TRUCKS

DROP FORGINGS

Open Hearth or Alloy Steel
Capacity, 1800 Tons Per Month

TYPICAL TRUCK FORGINGS
CHANGED MONTHLY

FRONT MOTOR SUPPORT 34 Lbs.



Overall 34″

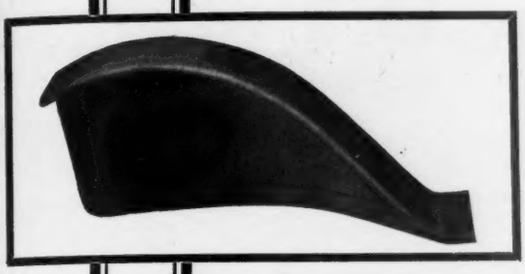
REAR MOTOR SUPPORT 48 Lbs.

Overall 34″

Heat Treating and Complete Laboratory Equipment
MACHINE FINISHED CRANKSHAFTS

UNION SWITCH & SIGNAL COMPANY
2 Miles East of Pittsburgh **Swissvale, Pa.**

For Service and Appearance



Sheet Metal Parts that receive careful consideration from buyers are selected on the basis of quality and style. The tendency is becoming more marked for motor truck makers to select

Sheet Metal PARTS

with the care and attention they deserve. Our Acetylene-welded Tanks, Fenders, Sod Pans, and Stampings are sturdily constructed to last with built-in quality that resists wear.

You can secure this certainty of quality and pleasing appearance as well at prices that are surprisingly reasonable. Consult us about Hoods, Fenders, Tanks, etc. We can satisfy you as to quality, deliveries and price.

Motors Metal Mfg. Co.
Milford Ave. and P. M. Ry. Detroit, Michigan

VERTICAL or OBLIQUE HYDRAULIC HOIST

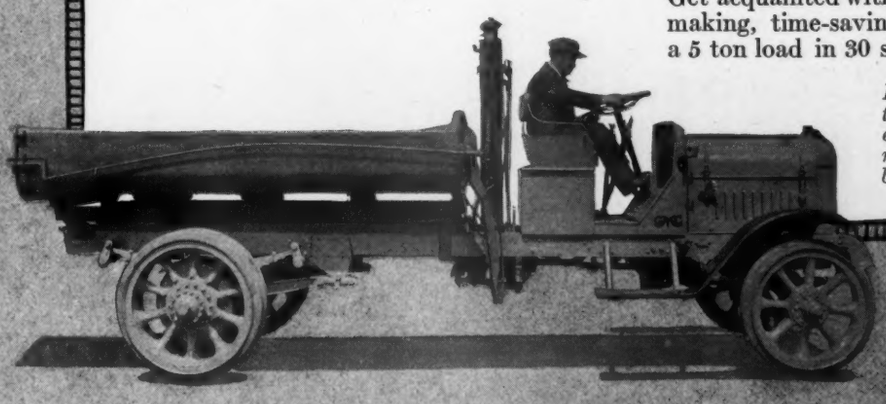
A Stranger to the Repair Shop

Here's one reason: We make a special layout and a special Hoist to fit the particular make of chassis on which it is to be installed.

Here's another: We seldom build a Hoist with piping under pressure. Instead, the pump is mounted integral with the base plate or attached thereto through a solid manifold steel bracket.

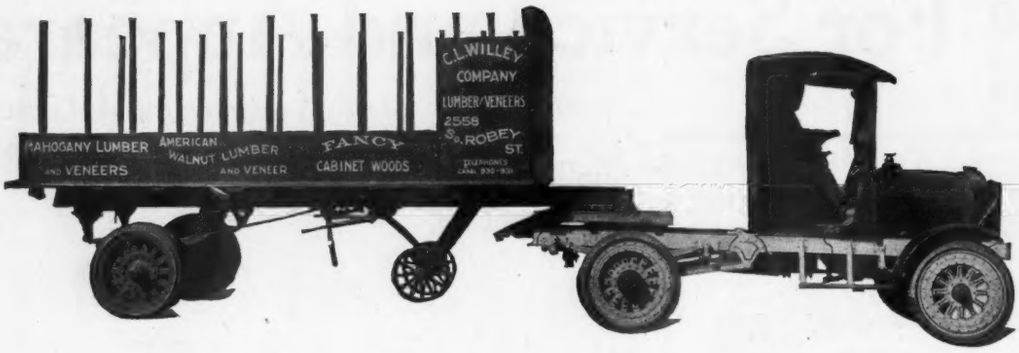
Get acquainted with the durable, money-making, time-saving Hoist that dumps a 5 ton load in 30 seconds.

Let us submit the proof that the Hydraulic is the most efficient Hoist for YOUR needs. Send us your blueprints.



HYDRAULIC HOIST MFG. COMPANY,
292 WALNUT STREET,
ST. PAUL, MINN.

Couples Instantly Without Use of Jacks



Trailer Brakes Operate From Driver's Cab

WHEN YOU SELL LAPEER TRAILERS

you sell ***continuous satisfaction.*** Your customer obtains the most economical hauling equipment in existence, and re-orders from these customers are sure to come to you, as Lapeer performance cannot be duplicated.

Sell the Lapeer Trailer; it is far the most efficient and highly developed transportation unit. Desirable exclusive territory remains open. Write for proposition.

LAPEER TRAILER CORPORATION, Manufacturers

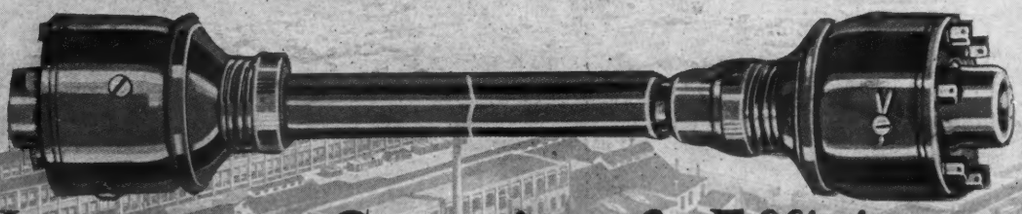
General Sales Office

M. E. RYAN, 2807 Michigan Avenue, Chicago

The Factory Behind

Hartford

The Joint of Universal Satisfaction

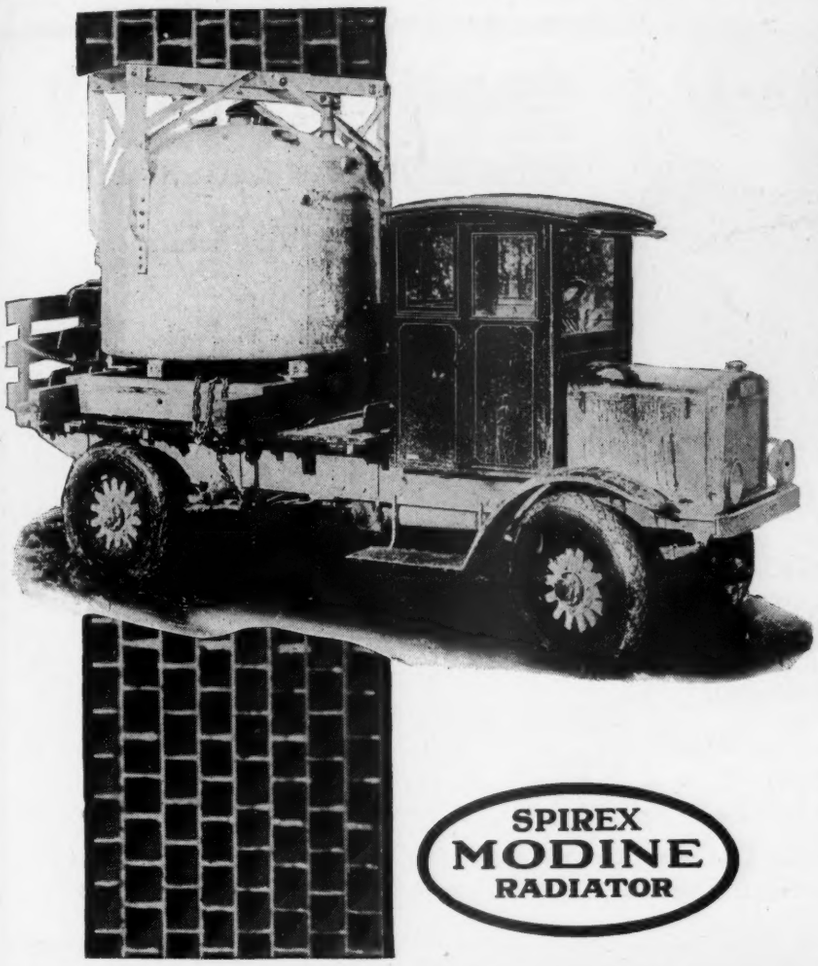


Increased Capacity & Efficiency of Organization

Insures Dependable Service Always

Hartford Automotive Parts Co.,

HARTFORD, CONN.



SPIREX
MODINE
RADIATOR

Where the Roads Consist of Heavy Mud

This mud-battling Oshkosh truck furnishes another instance of the great cooling capacity of the Modine-Spirex radiator.

It is used by a condensary in a territory where the roads are "impassable" in wet weather. However, this Oshkosh 4 wheel drive truck wades right through, although of course traveling constantly at low speed.

While an ordinary cooling system would be incapable of handling its work satisfactorily under these difficult conditions, this Modine-equipped Oshkosh keeps the hard working truck motor cool, and makes it possible for the truck to stay on the job.

The marked performance of the Modine-Spirex is due to a superiority of design. Within each air cell is built a spiral vane that whirls and holds the coldest air against the hot water channels. At the same time it provides great reenforcing strength, and makes possible an unusual light weight construction.

That's why you should make sure that the truck you sell is Modine-equipped. Let us supply you with the names of such trucks.

MODINE MANUFACTURING CO.
Racine, Wisconsin

OHIO STEEL CASTINGS

Customers
who invariably specify OHIO Steel

know from experience that our castings are tough, but not too hard.

Brake-Spider cast for the Kelly-Springfield Motor Truck Co., Springfield, Ohio.

They know, too, that our castings are uniform in texture, true to pattern, electrically annealed, and rigidly inspected, thus eliminating extra machining cost.

These are some of the reasons why the Kelly-Springfield Motor Truck Company uses OHIO Steel where extreme wear and tear is experienced.

The biggest volume of our business comes from customers who depend upon us year after year for their steel casting requirements.

Send your blueprints and specifications for immediate quotation.

The Ohio Steel Foundry Co.
Springfield, Ohio

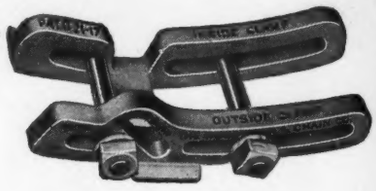
Larger castings made in our plants at Lima and Bucyrus, Ohio

No. 37. Prest-O-Grip Dual Clamp

Introducing the Latest Addition to the Prest-O-Grip Line

The first really universal clamp, fitting more trucks than any other device on the market. With this one size, 321 different trucks can be equipped with chains for traction purposes.

The standardized line of traction chains for all solid tire wooden wheel trucks with clearance for any anchored equipment. Can be sold by tire sizes of trucks, no other information needed.



Made by

The Rowe Calk and Chain Company, Plantsville, Conn.

Prest-O-Grip Spoke Clamps	Prest-O-Grip Traction Chains	Prest-O-Grip Lock Links	Hi-Lo Jacks

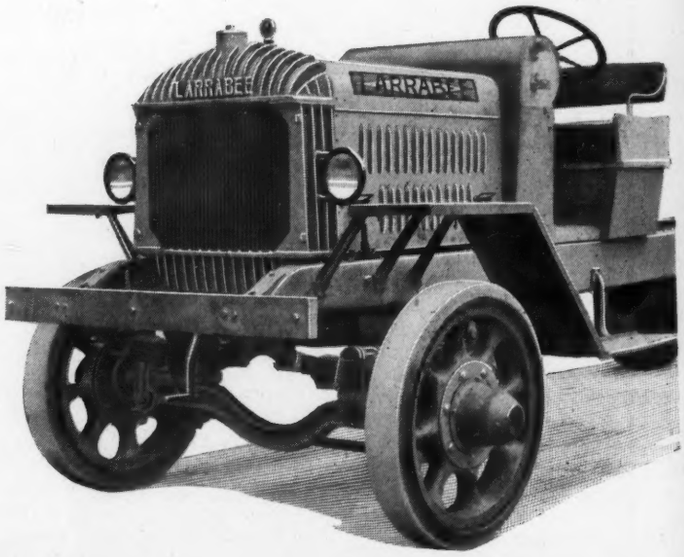
A Good Truck for a Good Dealer

The Larrabee is the Truck— Are You the Dealer?

The Larrabee factory is not curtailing production.

Where Larrabee Trucks are performing they are attracting the attention of other automotive dealers. Many good hustling dealers have come to us this way.

The Larrabee plan of expansion is soundly gaining ground. We have a most interesting proposition to make to dealers substantial enough to represent the Larrabee line. If there is not a Larrabee dealer in your territory there will be soon. You may be the man for the Larrabee. Write today.



Address: Dept. of Sales

Larrabee-Deyo Motor Truck Co.
(Incorporated)

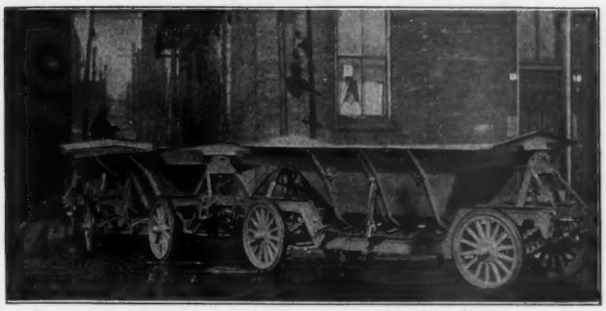
Binghamton **New York**

LEE LINE

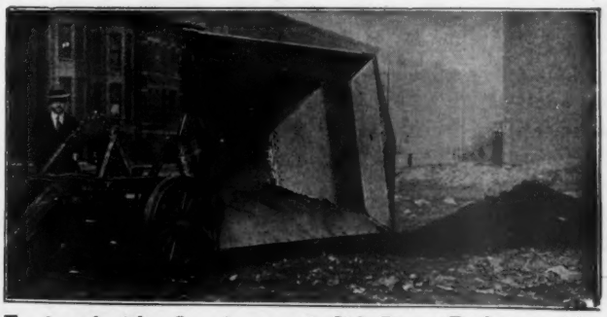
Trailers—Bodies—Loaders

Drop Frame Trailers

Brings the loading edge within easy reach. Reduces lifting height from 18 to 30 inches. Saves time and energy.



A low center of gravity eliminates sidesway due to rough and uneven roads and limits danger of overturning when rounding corners at high speed. Lengthens life of equipment.



Equipped with a Lee Automatic Side Dump Body, provides an efficient vehicle for anyone with loose materials to haul. Especially suited to stone and gravel hauling and for collection of ashes and garbage by municipalities.

Chassis also provided with platform, stake or panel body for hauling any kind of merchandise.

If it is a Trailer, Semi-Trailer, Motor Truck or Trailer Body, or special handling or hauling equipment—we make it.

LEE LOADER & BODY CO.

Builders of Automotive Auxiliary Equipment

2333 So. La Salle Street Chicago

The Final Drive That Stands Up

THE use of the worm gear drive grows and grows because it is the most desirable and satisfactory form of final drive for motor trucks.

It is the most efficient—97% efficient; it is the *quietest;* it is the most *compact;* it is the *simplest* and the *easiest* to lubricate perfectly; and it is the longest lived. A good worm gear stands an enormous amount of grief without showing any signs of wear.

Therefore, when quality, service and final efficiency govern, the worm gear drive is the choice.

And, because of correct design, fine workmanship and materials, "*Cleveland High Efficiency*" Worm Gears are more and more specified and used.

Do not forget that our engineering department, specializing exclusively on worm gearing, is at your service. Write.

The Cleveland Worm Gear Co.

"America's Worm Gear Specialists"

Cleveland, Ohio, U. S. A.

C. F. Quicke & Co.
315 Euston Rd., London, N. W.

Alfred H. Coates Co.
41 Spear St., San Francisco, Cal.

Cleveland WORM GEARS

OTHER GEARS WEAR *OUT*. THE WORM GEAR WEARS *IN*.

Pick
UNIVERSAL JOINT

Four Point Transmission

There are *Four Large Driving Members* in the Pick Universal Joint. Power is transmitted in a free and uninterrupted flow in every direction by these *Four* Bearing Points.

Lubrication is positive, and a leak-proof grease-retaining device prevents the escape of the lubricant.

Investigate this superior universal. Write for details.

Carl Pick Company, Manufacturers, West Bend, Wis.

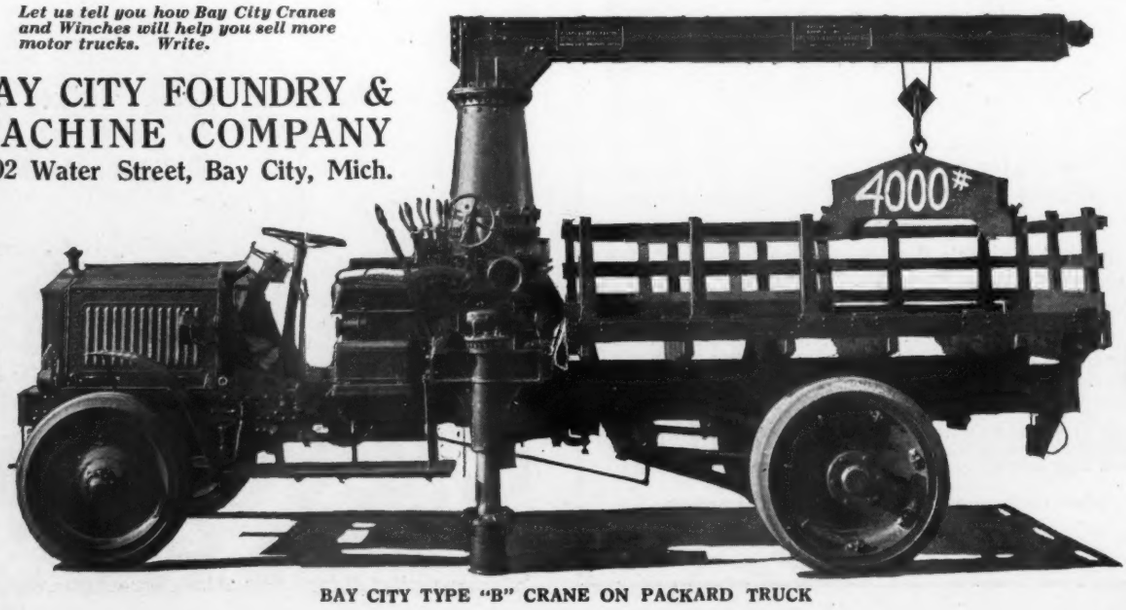
6,000 lbs. Capacity "B" TYPE **BAY CITY CRANE**

At 7½ ft. radius this compact, power-operated hoisting and turning mechanism has a capacity of 6,000 lbs. (longer booms can be supplied to meet special conditions).

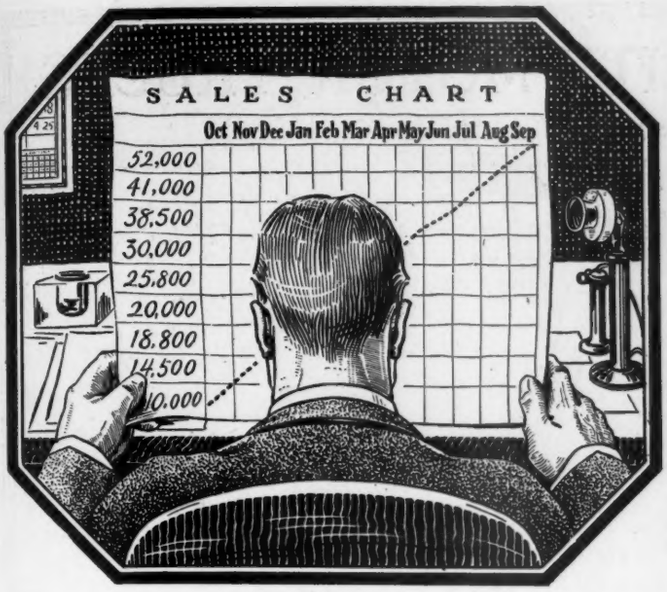
Dealers of heavy-duty motor trucks can do their customers an invaluable service by demonstrating the vast time and labor-saving advantages of this Crane. Particularly well adapted for quick handling of heavy machinery, castings, pipe, structural steel, etc.

Let us tell you how Bay City Cranes and Winches will help you sell more motor trucks. Write.

BAY CITY FOUNDRY & MACHINE COMPANY
1602 Water Street, Bay City, Mich.



BAY CITY TYPE "B" CRANE ON PACKARD TRUCK



"That Looks Good to Me"

Says the NOBLE Dealer

NOBLE MOTOR TRUCKS

There are *reasons* for that steady, upward sales climb.

Here are some of them:

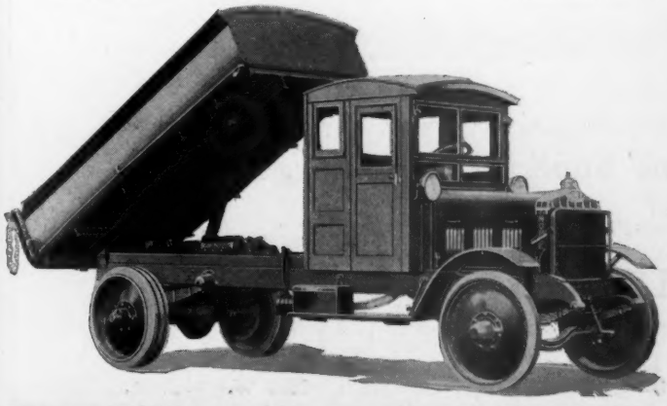
Sheldon Worm Drive Rear Axle converts 97% of the power into traction. Buda Engine delivers tremendous power. Eisemann Magneto supplies positive ignition. Tuthill Springs, Stromberg Carburetor, Fuller Transmissions, etc.

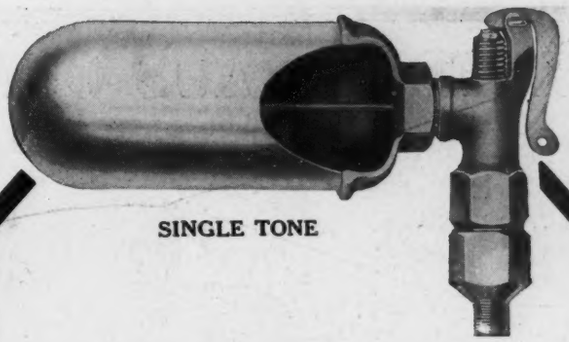
And a complete line of 1, 1½, 2½ and 3½ ton capacities enables the NOBLE Dealer to honestly recommend the precise type to meet each individual requirement.

Here are reasons for steadily increasing sales volume—and profits—over which you will do well to ponder and act.

Act—Write to

NOBLE MOTOR TRUCK CORPORATION
Kendallville **Indiana**





SINGLE TONE

BUELL
EXPLOSION WHISTLE
WARNS·EVERY·TIME

Nationally Advertised

Buell advertising is the dominant warning signal advertising of the year. Running consistently month after month in the big national publications, Buell advertisements are reaching millions.

Hundreds of thousands of motorists are already using Buell Explosion Whistles. Hundreds of thousands of others are in the market to buy. Many of these are right in your own territory. Take advantage of the tremendous popularity of the Buell. Cash in on the demand created by its advertising. If your stock of Buells is not complete, see your jobber today.

Buell Manufacturing Company
Cottage Grove at 30th **Chicago**

CHIME

LUEDINGHAUS QUALITY MOTOR TRUCKS

Model K—2 Ton Capacity

SPECIFICATIONS THAT MEAN POWER

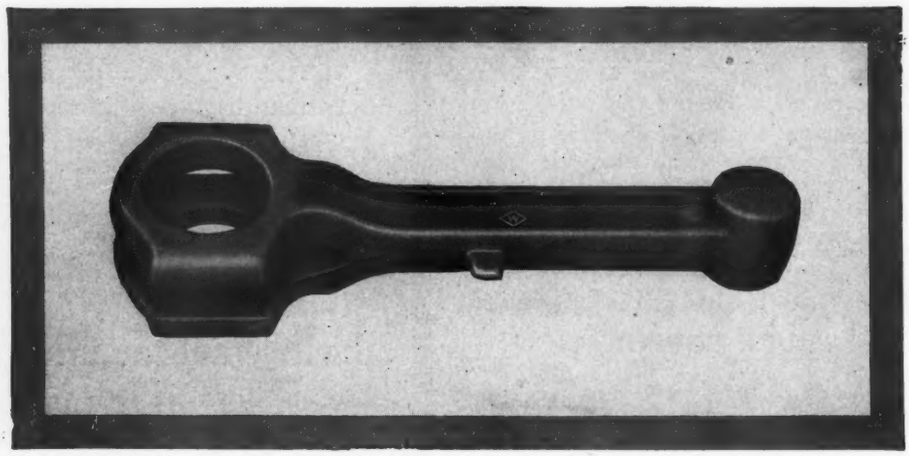
MOTOR: Waukesha, 4 cylinders, 4¼ in. bore x 5¾ in. stroke. Patented governor.
COOLING: Gear-driven centrifugal pump. Brass water connections.
RADIATOR: Built up type. Oversized.
CARBURETOR: 1¼ in. Schebler. Government type.
TRANSMISSION: Detroit. Three speeds forward, one reverse.
FRAME: Pressed steel. Flexible.
WHEELBASE: Standard, 145 in.; Long Standard, 170 in.; Tractor, 112 in. or over.
FRONT AXLE: Oversized, drop-forged, I-beam with Timken roller bearings.
REAR AXLE: Wisconsin. Worm Drive, semi-floating type. Special alloy steel shafts.
BRAKES: Two distinct systems.
RADIUS RODS: Steel I-Beams.
STEERING GEAR: Adjustable worm and nut type.
SPRINGS: Tuthill Titanic. Electric furnace alloy steel.
WHEELS: Artillery. Second growth hickory.
TIRES: Solid. Front, 36 x 4 in.; Rear, 36 x 7 in. Pneumatic: Front, 36 x 6 in.; Rear, 40 x 8 in.
EQUIPMENT: Two side and one tail lamps. Stewart & Warner speedometer, bumper, seat, cushion, horn, jack and tools, 18-gal. gas tank.

DEALERS Wanted in Territory Not Already Represented

BUILT BY

LUEDINGHAUS-ESPENSCHIED WAGON COMPANY

Established 1843 SAINT LOUIS, MISSOURI



For strength and dependability use drop-forgings. And if you use drop-forgings, specify **Williams' Superior Drop-Forgings**

J. H. Williams & Co.

"The Drop-Forging People"

BROOKLYN
80 Richards St.

BUFFALO
80 Vulcan St.

CHICAGO
1080 W. 120th St.

IRVING
SAFETY
RADIATOR GUARD

In this improved accessory, you'll find every good feature you could seek in a truck radiator guard—maximum protection with minimum weight—unsurpassed opening for air circulation—attractive appearance—the shock-resisting strength of the strongest form of steel grating made. This means safety for your radiator, and insurance against radiator accidents that would reduce the earning capacity of your truck in an amount far beyond the cost of an Irving Guard.

There's a size and style to fit your truck. Write for Circular 1B36, stating your make and model

IRVING IRON WORKS CO.
LONG ISLAND CITY, N.Y., U.S.A.

Manufacturers of

IRVING SUBWAY TRADE MARK (PATENTED) REG.U.S.PAT.OFF.
THE FIREPROOF VENTILATING FLOORING

O'BANNON COATED FABRICS
MOLESKIN

Benefits You and the Truck Owner

AS MOLESKIN costs less than leather and cuts to better advantage, its ability to lower costs is obvious.

It is water and scuff proof and its durability assures the truck owner of a seat covering which will last for years, always looking fresh and new.

Service of this kind pleases the truck owner and builds up Good Will for you.

May we send you a generous sample of Moleskin for test purposes?

O'BANNON CORPORATION
200 Fifth Avenue **New York**

Manufacturers of
Leather Substitutes **Rubberized Fabrics** **Enameled Goods**

Jennings Patent Automatic Dump Body for Ford One-Ton Truck

The above illustration shows the Jennings Patent Automatic Dump Body mounted on a Ford Ton Truck. Capacity of Body, 1¼ Yards.

This is no experimental proposition; hundreds in use and all users loud in their praise.

No expensive hand or hydraulic hoist required to dump this Body; dumped by hand lever and load released in ten seconds.

Automatic locking device that holds body from dropping back. Not a piece of cast or malleable iron on job; all wrought iron, which can easily be replaced, if ever broken, by any blacksmith.

Also built for Reo, Maxwell, Oldsmobile, International, Auto Car, and other makes of chassis in sizes from 1½ yards to 3 yards capacity.

Write quickly for agency proposition.

THE COLUMBIA WAGON COMPANY Drawer B COLUMBIA, PA., U. S. A.

Cold Rolled Strip Steel
IMMEDIATE SHIPMENT
The Hogan Stock of Cold Rolled Strip Steel is large and complete, and contains the correct tempers for all manufacturing purposes.
Make use of it.
JOHN R. HOGAN
Alloy Carbon and Cold Finished Steels
237 NORTH 6th STREET, PHILADELPHIA

K-9 Adjustable Wrench

MOSSBERG

ALL STEEL WRENCHES AND TOOLS

A Business-Building Line

THE dealer who sells Mossberg Tools not only makes a good profit—he gets a quick turnover on his stock and builds up his trade through satisfied customers.

The completeness of the Mossberg line makes the possibility of a sale greater. There is a wrench or tool for every purpose.

The garage man, the motorist, the expert mechanic, each with his individual requirements, may find the right wrench among your Mossberg stock.

The Mossberg reputation for strength and service helps you to make your sales—it builds your business.

Write for complete 1920 catalog

No. 45 Socket Wrench Set

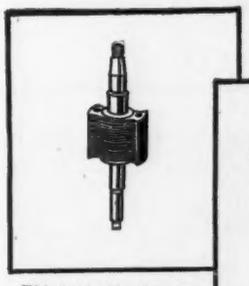
WALTER I. TUTTLE, *President and General Manager.*
FRANK T. CHASE, *Treasurer and Sales Manager.*
EVERETT L. FORD, *Secretary and Superintendent.*

FRANK MOSSBERG COMPANY
WRENCHSMITHS FOR 20 YEARS
ATTLEBORO MASSACHUSETTS

THE VITALS PROTECTED

The kick of an impulse starter, resulting from an initial speed of 600 to 800 revolutions per minute, soon paralyzes the ordinary "mag." The TEAGLE INDUCTOR-TYPE MAGNETO never notices that kick. It is built to stand such treatment.

There is ample space for mounting the stationary coil—enough to allow for sufficient winding and heavy insulation to produce the hottest, fattest spark.



This is the Teagle rotor feature of Teagle Inductor Type Magneto.

Regular armature of ordinary magneto, containing coil and condenser, the vitals of a magneto.

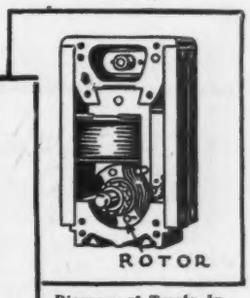


Diagram of Teagle Inductor Type Magneto. Note rotor, stationary coil and condenser, not affected by initial kick from impulse starter.

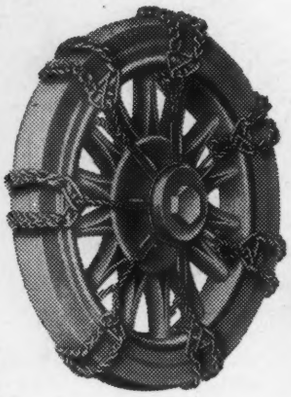
SIMPLICITY-RUGGEDNESS
EFFICIENCY-ECONOMY
Always associate these Qualities with

TEAGLE MAGNETO

A BETTER SPARK IN A SIMPLER WAY

Write to 1129 Oregon Avenue today to learn how Teagle overcomes other ignition troubles

CONFORMS TO S.A.E. STANDARDS
THE TEAGLE COMPANY CLEVELAND, O.



Write for Dealer Proposition NOW!

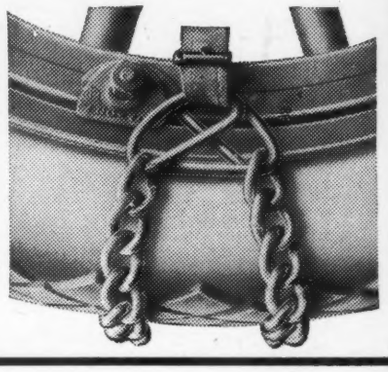
DAUBENSPECK DUBL-BILT

SINGLE UNIT NON-SKID TRUCK CHAINS

One thing that makes these Single Unit Chains such ready sellers, is the easy way with which they can be put on and taken off. The driver can adjust a single unit or as many units as may be required, *without jacking up the load.* Another factor is the wonderful performance of the chains after they have been attached. There is no rolling, locking on or cutting of tires. Chains are free to float on tires, and in every instance they give perfect traction.

MINUTE GRABS—FOR EMERGENCY

There is nothing slow about Minute Grabs. They are riding into greater popularity with every pair sold. Our principal problem for the past year has been to make enough to supply the demand. Increased production now enables us to take care of all dealers promptly. They sell best because they serve best. Can be put on quickly from the running-board, and will get a car out of mud hole without inconvenience or loss of time. Every car should carry a pair for emergency use.

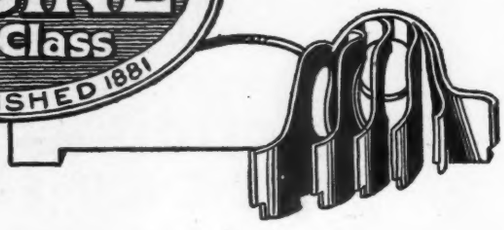


3½ and 4 inch sizes, per pair, $3.00 4½ and 5 inch sizes, per pair, $3.25
(One for each rear wheel)

Get our interesting dealer proposition

DAUBENSPECK CHAIN CO. BUTLER, PA.

THE BUDA COMPANY
BUDA ENGINE
High-Class
ESTABLISHED 1881



One of the first engine builders to recognize the possibilities of the Laminated Shim—

The Buda Company by continuing to equip its engines year after year with shims of Laminum pays us the highest possible compliment.

"Peel one down to fit" and you'll understand

LAMINATED SHIM CO.
47 W. 34th St., New York.
Detroit: Dime Bank Building
St. Louis: Mazura Mfg. Co.
England: R. A. Rothermel, 24-26 Maddox St., Regent St., London, W. I.

LAMINUM

"Start Her With a Starter!"

Truck drivers are human beings. Give one of them a truck that handles easier, pulls better, or gets away more quickly, and you'll see him *making* opportunities to make the most of it for *your* advantage. Put him at the wheel of one of the trucks that is now obtainable with Westinghouse Electrical Equipment, so that he doesn't have to crank his engine, and then watch him get away from the platform ahead of the trucks that start by hand.

Here is a truck with a Westinghouse starter. The driver has made a ten minute stop. When he's ready, he will not have to climb up, set his throttle and his spark, throw in his switch, climb down, crank a high compression engine once or twice or a dozen times, climb up again, before he can get away. This driver presses a button and saves a minute. *He saves 10 per cent of a total loss,* because *a truck earns only when it moves.*

WESTINGHOUSE
ELECTRIC & MANUFACTURING COMPANY
AUTOMOBILE EQUIPMENT DEPARTMENT

General Sales Office: 110-114 West 42nd St., N. Y. C.
Works: Newark, N. J., and Springfield, Mass.

Westinghouse
ELECTRICAL EQUIPMENT FOR AUTOMOTIVE VEHICLES

ANNOUNCING

ARVAC
TRADE MARK

MODEL 20

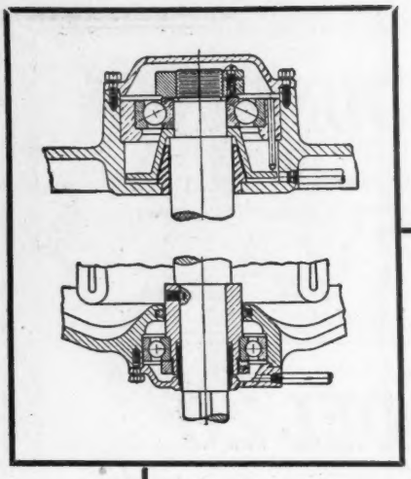
BELIEVING that the trade will look with favor upon our constant endeavor to keep pace with the requirements of present day Automotive Engineering, we take pride in announcing *the early production of* ARVAC Model 20.

In this new model we have *retained* the well known features of ARVAC superiority, and have *gained* in refinement and durability. We truly believe that the Model 20 realizes the highest ideals of the industry.

By inviting a consultation you will *involve no obligation*—perhaps the Model 20 will give you an entirely new angle on Universal Joint efficiency. We recommend and invite the most rigid investigation and comparison.

A request for detailed information will receive our prompt attention.

Arvac Manufacturing Co.
ANDERSON, IND.



Ball Bearing Mounting for Vertical Motor Armature Shaft

The upper bearing shown is a Gurney Radio-Thrust, which carries weight of armature and revolving parts, as well as the radial load.

The lower bearing shown—a standard Gurney Radial—takes the belt pull.

Both bearings are of the annular ball type, but of greater load capacity than any others of similar bore and outside diameter can be, on account of the Gurney patented construction which permits the use of more and larger balls.

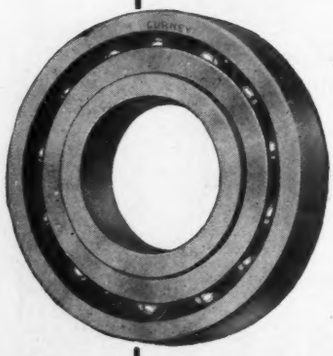
Note the simple and compact design, due to elimination of third bearing for carrying thrust alone.

Send for our G-2 Bulletin which gives detailed specifications, and illustrates examples of successful application of Gurney Ball Bearings.

GURNEY BALL BEARING CO.

Conrad Patent Licensee

JAMESTOWN NEW YORK



GURNEY

BALL BEARINGS

The Careful Truck Maker, Seeking the Best, Should Always Specify

"M & E"

UNIVERSAL JOINTS

(Patented and Patent Pending)

We are regularly receiving repeat orders from more than 30 Automotive Vehicle Manufacturers now using our Universal Joints and Drive Shafts as standard equipment.

Strength, Simplicity and Endurance are the outstanding features of the "M & E" Universal Joint in actual service. They are built to hold up under the extreme strain and stress of heavy service.

A Size for Every Car

Let us estimate on your requirements. We have the facilities for large production.

MERCHANT & EVANS Co

NEW YORK PHILADELPHIA WHEELING
BALTIMORE CLEVELAND
LANCASTER, PA. DETROIT
ATLANTA CHICAGO
KANSAS CITY

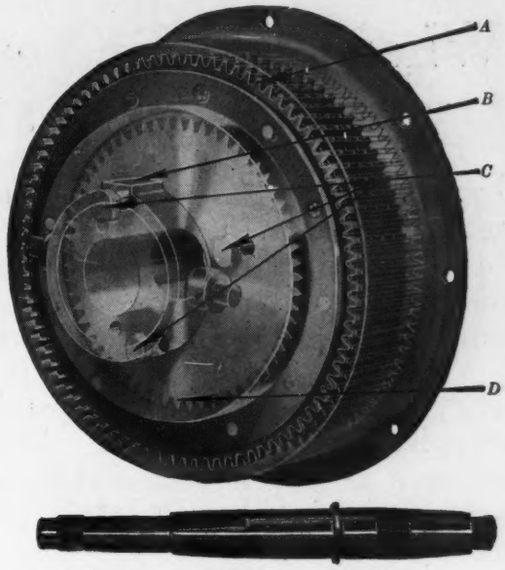
The Velvet Clutch *With the Bull-Dog Grip*

DETLAFF

Multiple Disc Clutches

Detlaff clutches do give better service—not by accident but because of their better design. Specially designed springs give smooth action without frequent adjustment. Specially treated facings give easy but positive grip and resist wear to an astonishing degree.

They are complete units, easily installed, and as near trouble proof as skill, design and exacting standards can make them.



A, D—Gear-tooth drive on all discs
B—Lubrication from any convenient point
C—Long, easy springs compensate automatically for facing wear

Detlaff clutches are made in a full range of sizes giving a unit for any torque demanded. We will gladly send full data to manufacturers.

A. J. Detlaff Company, 124 Lafayette Ave., East, Detroit, Mich.

96 Ninth St., San Francisco
202 Chamber of Commerce, Indianapolis
2 Columbus Circle, New York

(49)

WOLVERINE

1½ and 2 TON TRUCKS

The Winning Sales Argument

The trump argument that wins sales for the Wolverine Dealer is the very same point that wins us dealers, viz: The triumphant record of Wolverine truck performance.

We want to show you just how completely this mechanically perfect truck has been satisfying dealers and their customers over a continuous stretch of years. We want to submit to you the proof that this brute of a truck operates at a lower cost per ton-mile than you ever knew before.

In cold black and white, we want to present you with the figures that prove the Wolverine is the unusually profitable proposition we claim for it.

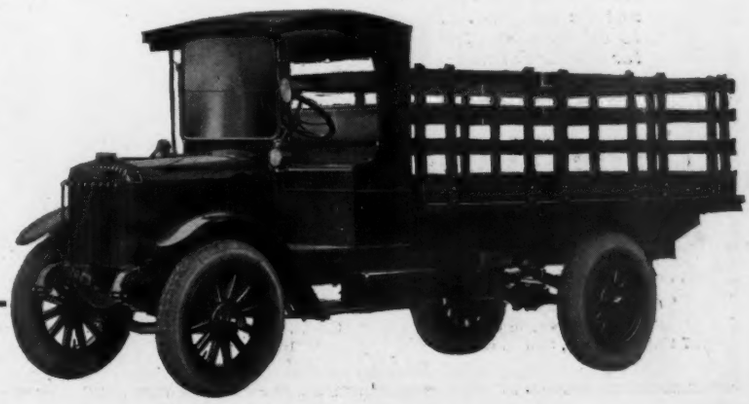
Send for the Proof—NOW!

The American Commercial Car Co.

Gratiot Ave. and Detroit Term. R. R.
Detroit, Michigan

Approved Units

Rugged Continental Motor that supplies abundant power at least cost. Dependable Lighting and Ignition System. Special Wolverine Cast Shell Radiator. Powerful Russel Internal-Gear Drive Axle. Heavy drop-forged front axle, equipt with Timken bearings. Irreversible worm and gear Steering Gear. Selected heavy 5" Steel Channel Section Frame. Heavy-duty artillery-type wheels. Wheelbase, 140".



Where You Fix Your Own Truck-Costs

Users of motor trucks may get price reductions from the manufacturer, but reductions in operating costs they must put into force for themselves.

They will reduce mileage cost by stopping waste of the stuff mileage is made of—such as gasoline, oil, battery maintenance, tires and sundry supplies.

You can fix the price of your mileage often 10% to 20% lower with a

Veeder

HUB ODOMETER

to indicate ***how far*** each purchase of fuel and supplies actually goes—or could by better handling be ***made*** to go.

The Veeder always adds mileage, whether truck runs forward or backward; totals cannot be falsified. Regular model adaptable to all standard trucks, $20. Special model for FORD Commercial Cars, $15. Write for complete information.

The Veeder Mfg. Co.

10 Sargeant Street Hartford, Conn.

New York Distributor
Quinlan-Treiber Corp.
5 Columbus Circle

Detroit Distributors
Geo. F. Balk Sales Co.
9 Selden Street

Chicago Distributors
Carey G. Wirick & Co.
564 W. Randolph St.

California Distributors
F. Somers Peterson Co.
57 California St., San Francisco

Philadelphia Distributors
Crown Auto Specialties Co.
1611 Vine Street

WARNER
HEAVY DUTY
TRUCK TRAILERS
TWO AND FOUR WHEEL TYPES

FOR every trucking need there is a Warner Trailer to make every truck more profitable. Warner Trailers shoulder the lion's share of the load. Built on the best truck construction principles to stand up under the hardest service with the best trucks.

Owners of light trucks will be interested in the Warner Model S-5, an extremely practical proposition that will handle a load of better than 4,000 lbs. Equipped with pneumatic tires. This Warner Trailer and a ¾ to 1 ton Truck creates practically a two-ton truck at a very low investment figure.

A handy and economical hauling unit for merchant, manufacturer or farmer. Write for literature and full information on how to halve hauling costs.

The Warner Mfg. Co.

23 Main St., Beloit, Wis.

The Construction tells the Tale

DEPENDABLE

The Better Truck to Sell

The DEPENDABLE Dealership is the most profitable long-time investment the dependable dealer can make. Maybe *your* territory is still open. *Write.*

Dependable Truck & Tractor Company
Galesburg Illinois

Brief Specifications

Buda Motor
Wisconsin Worm-Drive Axle
Dixie Magneto with Impulse Starter
Fuller Transmission
Long Radiators
Ross Steering Gear
Pierce Governor
Timken Bearings
Morse Viscometer

TRAGESER TANKS

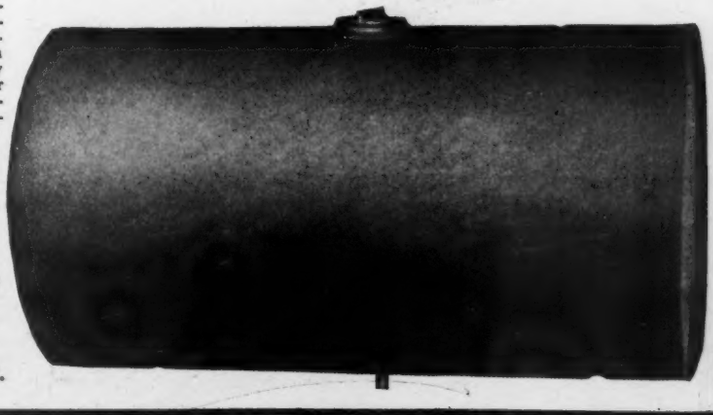
Flat Head Gravity Tank for Trucks
Tinned by Hot Process

The inside and outside tinning of this No. 16 gauge steel Gasoline Tank is expertly done by the hot process—which insures a perfect coating.

The seams are welded—not soldered or riveted—and make tight joints that *stay* tight. The filler cap is brass.

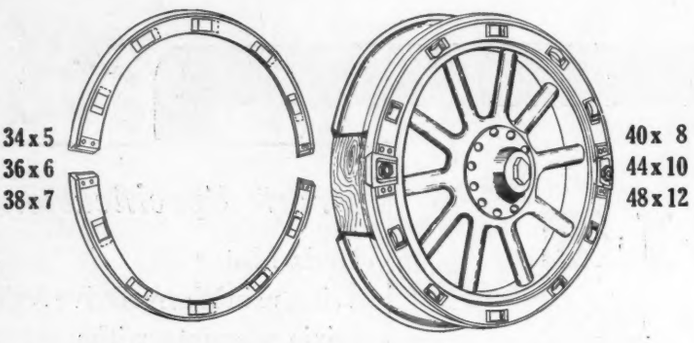
Under the watchful eyes of carefully trained inspectors each tank is tested by air pressure under water—which explains why we unqualifiedly guarantee our Tanks to be absolutely tight.

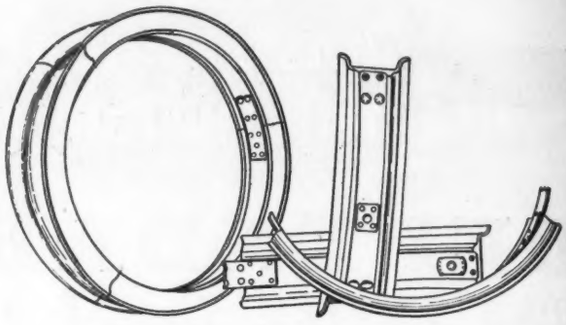
Have your tanks made the TRAGESER WAY—right. Send your blueprints.



John Trageser
Steam Copper Works
447-457 West 26th St.
New York, N. Y.

Tappings Made as Desired





Copithorn Truck Type Demountable Rims Are Mechanically Perfect Because:

1. Copithorn Truck Type Rims are removed from the tire, not the tire from the rim.
2. Any make of pneumatic tire may be used with a Copithorn Rim.
3. Copithorn Rims fit all standard truck type felloe bands.
4. Pinching of tubes and valve stem tears are impossible.
5. Copithorn Rims have no side rings or locking rings which require hammering.
6. Pounding or prying the tire is absolutely inexcusable.
7. Running on a flat tire is unnecessary.
8. No tools other than a common screwdriver are necessary to mount or dismount a Copithorn Rim.
9. Time schedules are not interfered with by tire or tube changes.
10. Copithorn Rims will not warp.
11. Anyone can change tubes on a Copithorn Truck Type Rim in five minutes, regardless of how badly the tire is rusted to the Rim.

To mount a Copithorn truck type rim upon a wheel, the rim is placed over the felloe band in the usual manner. Then the two slotted steel bands are placed on the wheel, the tapered slots sliding under the heads of the gooseneck bolts by means of the action of the locking wedge and are thus held firmly in place. This operation is all that is necessary to secure the complete fastening of the rim to the wheel with ten bolts.

The removal of the rim from the wheel is accomplished by first loosening the locking wedge, then tightening the wedge on the opposite side of the wheel, thus sliding the rings in the opposite direction and causing the gooseneck bolts to throw the slotted steel bands from the wheel.

The entire time to either mount or dismount a rim from the wheel requires less than one minute.

The construction of Copithorn rims permits a compactness in shipping requiring one-third of the space used by solid rims.

The advantages of the Copithorn truck type demountable rim, amongst which are the saving of time, labor and money, are the results of constant tests conducted since 1905. All these features are covered by a series of patents both in the United States and foreign countries.

The C. K. Seymour Corporation
Eastern Office:
Little Building, Boston

SMITH
PRESSED STEEL FRAMES
Made in the Largest and Best Equipped Frame Plant in the World
A.O. SMITH CORPORATION, MILWAUKEE
Detroit Office
708 Ford Bldg.

COVERT TRANSMISSIONS

The truck, tractor or motor car containing a Covert Transmission may cost slightly more, but it will be far more valuable to you.

COVERT GEAR CO., INC.

Sales, Engineering and Factory: **Lockport, N. Y.**
Export Offices: **100 Broad Street, New York City**

ACME TRUCKS

Acme Dealers Are "Going Through"

Trucks have to be *sold* these days—we might as well face that fact squarely.

Some trucks, however, require less selling than others. Acme is numbered among the trucks which go a long way toward selling themselves. Past performance and a proved record of dependability make Acme a preferred choice among truck buyers.

Acme's proved units are also factors of great influence on sales. These well known parts—the products of highly specialized industries—combined with Acme engineering give to the Acme its undoubted qualities of powerful enduring performance.

Hence Acme dealers are "going through." And they thrive on a repeat business which results from handling a truck that renders steady day-in and day-out service under the most difficult circumstances of truck operation.

Built in 1, 1½, 2, 3½ and 5 ton models

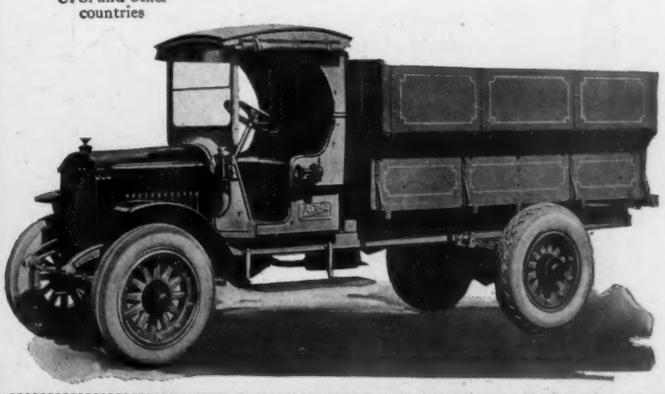
Seal of dependable performance

ACME THE TRUCK OF PROVED UNITS

Trade mark registered U. S. and other countries

Write for Full Particulars of Our Dealer Franchise

Acme Motor Truck Co.
362 Mitchell St.
Cadillac, Michigan



IRON CITY Springs

Pyrometrically controlled heat treatment and thorough testing assure dependable performance. Let us quote on your needs

have earned their present prestige and sound reputation as a result of dependable service and performance. Truck makers who include them in their assemblies know that they can place the full measure of responsibility upon them.

Iron City Spring Company
Pittsburgh, Pa.

Factory Representative
THOMAS J. WETZEL
New York Detroit

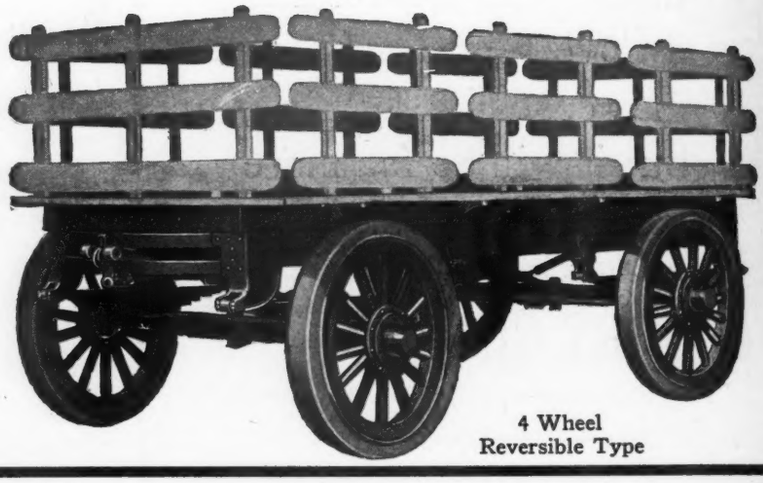
Byron

BYRON ENGINEERING WORKS · The Byron Trailer · LOUISVILLE, KENTUCKY

The BYRON agency offers unusual opportunity to energetic dealers. By dependable, efficient performance, BYRON TRAILERS have built a reputation that is a tremendous selling asset. They can compete successfully with every other high-grade trailer on the market, at prices that allow the dealer a very liberal margin of profit. Manufactured in the following types: 4 wheel reversible (3 ton and 5 ton), semi-trailer (6 ton and 4 ton), pole trailer (4 ton and 2½ ton.)

Good territory is still available. Write or wire for our proposition.

The Byron Engineering Works
Incorporated
General Offices and Factory
LOUISVILLE KENTUCKY



4 Wheel
Reversible Type

THE MAN WHO INSTALLS *Packard* CABLE WILL NEVER FEEL LIKE DOING THIS

Have you ever felt this way yourself?

Then why sell an inferior cable to your your customers?

A cable that you can consistently recommend to your customers at all times is worthy of the good will it will give you among the men who deal with you.

Packard Cable is scientifically fortified against the attacks of heat, oil, water and vibration.

Send for samples and dealers' proposition

The Packard Electric Company

Warren, Ohio, U.S.A.

District Offices:
Atlanta, Ga.; Chicago, Ill.; Dallas, Texas; Detroit, Mich.; Kansas City, Mo.; Minneapolis, Minn.; New York, N. Y.; San Francisco, Cal.; Seattle, Wash.

Tite flex

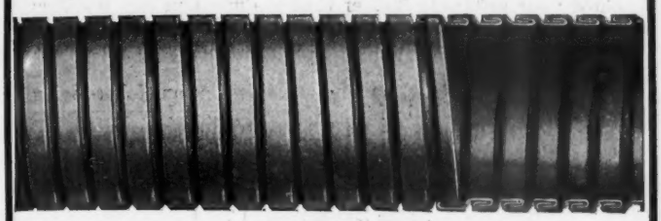
REG. U. S. PAT. OFF.

ALL-METAL TUBING

FLEXIBLE without sliding joints, TIGHT without packing

Enlarged section of Titeflex All-Metal tubing, showing detail construction. The diaphragm action of the convolutions produces flexibility.

We manufacture all of the INTERLOCKED types of tubing for Exhaust, Hot Air and Wire Covering.



Write for Literature

TITEFLEX METAL HOSE CORPORATION

Badger Ave. and Runyon Street Newark, N. J.

THREE B

BBB

BLOOD BROTHERS MODEL B

UNIVERSAL JOINTS

Serve Unfailingly

Model B joints are designed and built to transmit maximum motor power constantly and dependably.

Transmission oil is force fed to Oversize Bearings by centrifugal action, insuring positive lubrication. A single opening simplifies feeding Model B joints, and they require a minimum amount of attention.

Drop-forged yokes in one piece give them Brute Strength.

A Request Brings Further Details

Blood-Bros. Machine Co.

Pioneer Builders of Universal Joints

Allegan F. Somers Peterson Co. San Francisco, California Western Representative Michigan

For Weak MOTORS

New motors will perform up to scratch with almost any ordinary Piston Ring. Weak or worn motors won't. It takes

PRESSURE PROOF PISTON RINGS

to bring back permanently that almost forgotten power, quick getaway, real reliability and comfortable economy.

Of course, if Pressure Proof Piston Rings were installed first, motors could not lose their original vim and power.

One 3-part or two 2-part rings per piston are all you need.

POWER PP ECONOMY P P ENDURANCE

MANUFACTURED BY

PRESSURE PROOF PISTON RING CO.

107 MASSACHUSETTS AVE. BOSTON MASS.

CANADA - PRESSURE PROOF RINGS LTD. Sherbrook, Quebec

When Springs Break
put on
VULCAN
QUALITY
AUTOMOBILE SPRINGS
IN STOCK FOR YOUR CAR
This is the VULCAN service sign
The Sign of Profit
This sign stands for America's highest quality replacement-spring.
This Sign brings thousands of motorists, every year, to the doors of over 7000 dealers who display it.
This sign puts large and ever-increasing profits into the cash-drawer of every one of these dealers.
If Your Jobber Cannot Supply You, Write Us Today.
Jenkins VULCAN Spring Company
Factory
Richmond, Indiana
This Spring Rack FREE with first order for 12 or more VULCAN springs.

TOWER TRUCK
STRENGTH SERVICE

"The Freight Car of the Highways"

1½, 2½, 3½ and 5 Ton Models

Indorsement

Embodying Brute Strength, Handling Ease and Uninterrupted Performance at uncommonly low ton-mile cost, Tower Motor Trucks receive the unreserved approval of discriminating Dealers, Owners and Drivers.

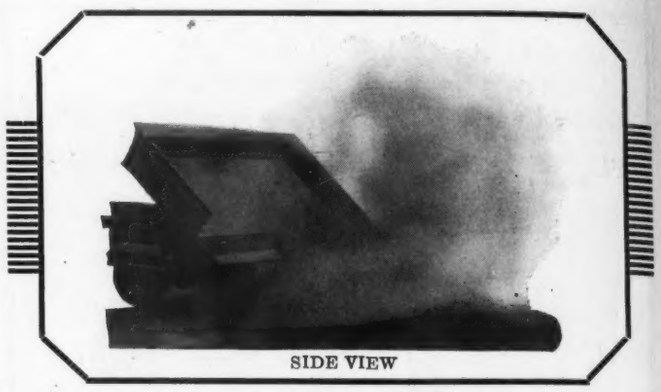
Write or wire at once for the valuable Tower selling franchise. Dealer territory may still be available

Direct Factory Branches

Minneapolis Chicago
Indianapolis Detroit

Tower Motor Truck Co.

Greenville Michigan



SIDE VIEW

Dumps a 3 Yard Load in 1½ Minutes

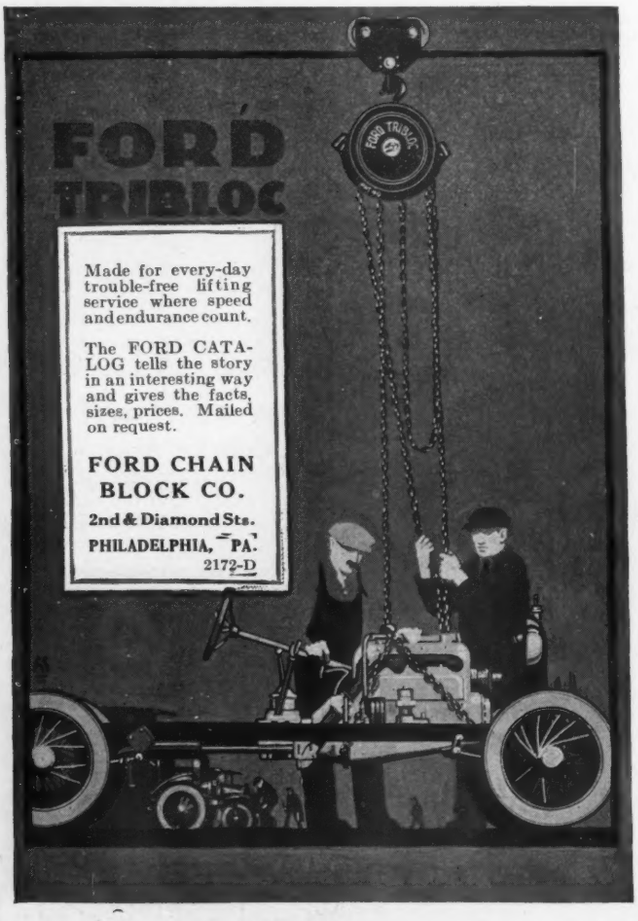
That's the kind of demonstration of the Automatic Side-Dump Body that convinces.

Show your prospects further that it dumps in any weather; can't get out of order; occupies all available space back of driver's seat; dumps all the load off without operating truck; fits any chassis.

Outwears any truck. Its many valuable time and labor-saving advantages emphatically influence customers to buy your trucks equipped with Side-Dump Bodies. Write for interesting dealer proposition.

AUTOMATIC DUMP CAR COMPANY
Sales Department 7
1603 Ernsperger St. South Bend, Ind.

Automatic Side-Dump Body


FORD
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Made for every-day trouble-free lifting service where speed and endurance count.
The FORD CATALOG tells the story in an interesting way and gives the facts, sizes, prices. Mailed on request.
FORD CHAIN BLOCK CO.
2nd & Diamond Sts.
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GET OUR NEW CATALOG "V" SHOWING

BANTAM

The BANTAM BALL BEARING CO.
BANTAM, CONN.

USED ON THE BEST MOTOR TRUCKS

THE BANTAM BALL BEARING CO.
BANTAM, CONN.

BEARING SURFACES FITTED TIMESAVER TRADE MARK WITHOUT SCRAPING

Perfect Bearing Surfaces

With TIMESAVER Bearing Abrasive Compound, unskilled men now produce perfect bearing surfaces in a quarter the time with a quarter the labor.

TIMESAVER Compound fits any size or type of babbitt, brass or bronze bearing. It is harmless in use for it turns to a lubricant after the cutting is done.

Send **$1.50** for a trial can and make your own tests. Six can cartons, **$9.00.**

IMPORTANT

Imitations of TIMESAVER are being exploited. We suggest for your protection that you insist on getting TIMESAVER when ordered. Full legal rights will be sustained.

M. T. K. SALES CORPORATION

296 Andrews Street, Rochester, N. Y.

Manufacturers M. T. K. Products Co., Seattle, Washington

GOES ON LIKE A HUB CAP

NO DRILLING NO PINNING

The Dreadnaught Indestructible Hub Odometer with Automatic Drive may be had at the following prices:

Ford and Maxwell model $17.00
For all other motor vehicles $20.00

Write for booklet and list of sales and service stations.

AMERICAN TAXIMETER CO.

20 West 61st Street **New York, N. Y.**

MOTOR WHEEL CORPORATION

Manufacturers of Motor Vehicle Wheels Complete —Metal Stampings, Steel Products

LANSING, MICHIGAN

Prudden Wheel Plant, Lansing, Michigan
Auto Wheel Plant, Lansing, Michigan
Gier Pressed Steel Plant, Lansing, Michigan
Weis & Lesh Plant, Memphis, Tennessee

Eliminate Repair Bill "Adjustments" With

The CALCULAGRAPH

The Elapsed Time Recorder

The only way to satisfy customers is to render adjustment-proof repair bills.

Just as soon as you have to adjust an item the customer loses confidence in you—and you lose a customer.

You eliminate adjustments from the day you install the Calculagraph. You then can show in black and white the proof that your charges are absolutely fair. And this is all any fair minded car or truck owner asks.

Your mechanic pulls a lever when he begins a job and when he finishes. At the end of the day you have an accurate time-record on which to figure costs and charges. That's all there is to the Calculagraph.

Get full particulars on this indispensable repair shop trouble-eliminator. *Write!*

The Calculagraph Company

Dept. 10

30 Church Street

New York City

Specialists in

CHEVROLET, MAXWELL

Drive Gears and Pinions

for

Repair and Replacement

ACCURATE — RELIABLE — QUIET

Weekes-Hoffman replacement gears and pinions are made from alloy steels specified for gear purposes by the Society of Automotive Engineers, thus assuring materials of exceptional density and toughness. All gears and pinions machine finished, with bores accurately ground. Heat treated and tested for operation and endurance.

Chevrolet and Maxwell repairs and replacements in standard ratios.

Every garage and repair shop needs these in stock.

Write for complete details and attractive proposition

Weekes - Hoffman Co.

Syracuse, New York U. S. A.

Cable Address: "WEHOFFCO" Code: Western Union

BAKER

AUTO TRUCK SNOW PLOW

A Universal Attachment to Standard Trucks

This modern way of moving snow opens a new field for motor trucks. The Baker Snow Plow can be attached to the axle of all standard trucks. Easily raised and lowered. Protected from injury by spring hinged blades.

Motor truck dealers should investigate our selling plan at once. A good field is open for them.

Write for Descriptive Literature

The Baker Mfg. Co., 571 Stanford Ave., Springfield, Ill.

Let Experts Handle Your Regrind Work

THERE isn't a point in repairing an automobile motor where accuracy is so important as in regrinding cylinders and fitting oversize pistons. The accuracy of the cylinder walls—for an efficient, perfect working job—is such that the diameter of the cylinder walls must not vary more than .0005" in roundness and the base must be straight and absolutely square with the cylinder base.

Only expert cylinder regrinders, operating the most modern and approved machines, can produce the class of regrind work that is up to the proper standard. It is because we have both the men and equipment that our regrinding service is so popular with operators of high class garages.

Send your regrind orders to us for prompt attention and expert handling

Modern Electric & Machine Company

936-40 Fort Wayne Ave. :-: Indianapolis, Indiana

CYLINDER REGRINDING *and* PISTON SERVICE

PIERCE

GOVERNORS

KEEP YOUR TRUCKS ON THE JOB

"ONE MOTOR TRUCK ON THE JOB IS WORTH TWO TRUCKS IN THE REPAIR SHOP"

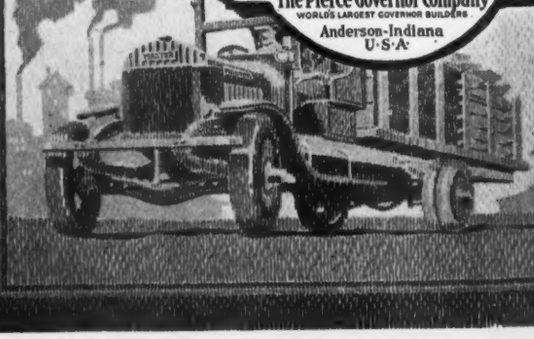
Trucks equipped with Pierce Governors cannot be driven at reckless speeds. They are therefore longer lived, make fewer trips to the repair shop, and can be operated more economically.

That is why "103" Truck Manufacturers supply Pierce Governors as regular equipment.

The Pierce Governor Company

WORLD'S LARGEST GOVERNOR BUILDERS

Anderson-Indiana U·S·A·



TITAN

A "Sure-Fire" Business-Getter

Wherever one TITAN has gained a foothold, more were sold very quickly. The TITAN does not require "high-pressure" salesmanship—it sells on performance—the kind of performance that commands consideration.

The conservative, desirable dealer appreciates the advantage of selling an article on merit. It means less sales resistance, lower service cost and "cleaner" business dealings—deals that do not require apologies later.

If you are that type of dealer or distributor, we may have the kind of contract you have been looking for.

2½ Tons 3½ Tons 5-6 Tons

TITAN TRUCK CO.
MILWAUKEE WISCONSIN

TRADE D.H. MARK

EGYPTIAN FIBRE

This is the toughest, most durable fibre known and is used by many truck makers for washers, gaskets, bushings, because of its superior qualities.

It is very durable, free from carbon, hard, and close-grained, slow to absorb and very resistant to shock.

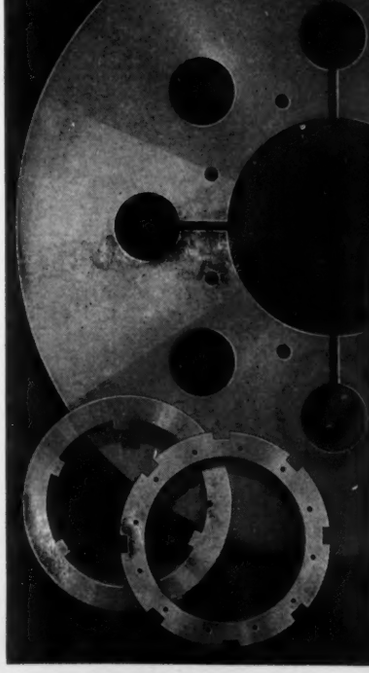
Send for samples or consult our development department regarding their use in your trucks.

Delaware Hard Fibre Co.
Wilmington, Del.
NEW YORK OFFICE:
1358 Hudson Terminal Bldg.
CHICAGO OFFICE:
564-570 W. Monroe St.

Berling
WORTH MORE
Magneto
DOES MORE

ERICSSON MFG. CO.
BUFFALO, N. Y.

CURTIS CLUTCH DISCS



CURTIS Steel Clutch Discs are furnished in high carbon or soft steel, plain or slotted, flat or formed, unfinished or ground and polished, tempered or untempered—any size.

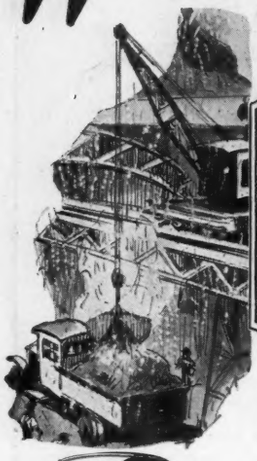
CURTIS CLUTCH DISC COMPANY
1835 Kienlen Ave.
St. Louis Missouri

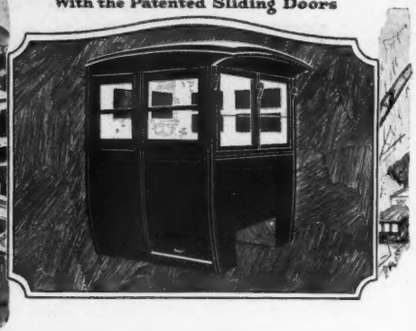
Weatherproof

ALL-SEASON

TOPS AND CABS

With the Patented Sliding Doors





Exterior

Interior

DETROIT Weatherproof Cabs protect truck drivers from dust in summer and driving snow in winter. Non-rattling windows on three sides. Disappearing, tightly fitting doors. Built for any size and style of truck. Send for complete data, literature and diagrams.

DETROIT WEATHERPROOF BODY CO.

PONTIAC, MICHIGAN

BLOOMING CUPS

Scientific Oil Lubrication — FOR — *Automatic Oil Lubrication*

OVERLAND FOUR CARS

1000 MILES ON ONE FILLING

Replace Regular Oil Cups

Easily Installed

SET OF NINE POSTPAID $6.75

CHARLES S. MONSON

Sales Department

2113 Dime Bank Bldg., Detroit, Mich.

SPECIAL PROPOSITION FOR DEALERS

MFG. BY BLOOM FLUSHER CO., TIFFIN, OHIO

GRANT SPEED TRUCK

Model 17

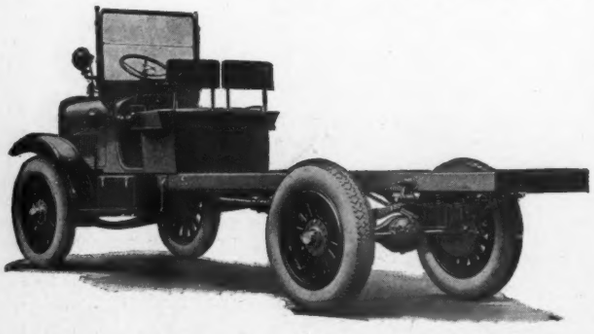
1½-2 Tons

Electric Starting and Lighting

Complete Equipment

140 INCH WHEELBASE

FAST—ECONOMICAL—DEPENDABLE



GRANT MOTOR CAR CORPORATION

CLEVELAND

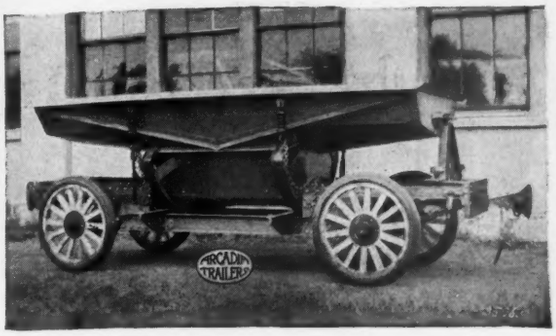
Increased Factory Facilities mean greater production and additional economy

The famous Walker Axle has so thoroughly demonstrated its superiority that the demand promises to outstrip the production capacity of the present plant. A new factory will, therefore, be erected at 87th and State Streets, Chicago, which will effectively solve the problem of building more axles and in addition will provide for the highest possible efficiency and economy in every manufacturing process from raw materials to finished product.

Walker Axle Company

General Offices: 72 West Adams St., Chicago, Ill.

Factory: East Chicago, Indiana



Clean Your City

With

Arcadia Trailers

Write for Special Circulars

We Build

A Trailer for Every Trade

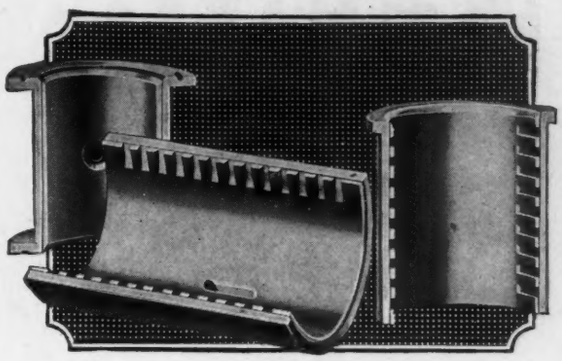
From One to Six Tons Capacity

Trailerize Your Trucks With Arcadia Trailers

Write for Trailer Information

Arcadia Trailer Corporation

19 Murray Street Newark, New York State



Babbitt-Lined Bronze Bearings

"Die-Cast by Doehler"

Quality first, last and always is the reason why Doehler Die-castings have always stood supreme. They are the accepted standard in the automotive industry—as in every other.

You can put your trust in

THE WORLD'S LARGEST MANUFACTURERS OF DIE CASTINGS

DOEHLER DIE-CASTING CO.

MAIN OFFICE AND EASTERN PLANT BROOKLYN, N.Y. CENTRAL PLANT TOLEDO, OHIO. WESTERN PLANT CHICAGO, ILL.

SALES OFFICES IN ALL PRINCIPAL CITIES

DDC-16

Built By

MUSKEGON MOTOR SPECIALTIES COMPANY

MUSKEGON, MICHIGAN.

By Reputation—"The Best Cam Shafts Made"

BRIDGEPORT

WORM DRIVE TRUCKS

Trustworthy, Dependable
Practical and Efficient

Offering Three Models

1½ Ton Chassis	$2350
2½ Ton Chassis	2850
4 Ton Chassis	3650

All Prices F.O.B. Bridgeport

The ALL-WORK Truck Sold
at an ALL-POPULAR Price

Bridgeport Motor Truck Company

Motor Truck Manufacturers

BRIDGEPORT CONNECTICUT

PATRIOT
Motor Trucks

A Large Jobbing House Writes:

"Our Patriot Truck has not cost us a cent for repairs, yet with goods as heavy as ours she always gets the limit and more. When it comes to adding more trucks, you will find us very 'Patriotic'."

Patriot Motors Company

Manufacturers

1331 P Street **Lincoln, Nebraska**

Revere Model	Lincoln Model	Washington Model
1500 to 2500 lbs. Capacity	*3000 to 5000 lbs. Capacity*	*5000 to 7500 lbs. Capacity*

SNEAD

CUSHION DRIVE

SHAFTS

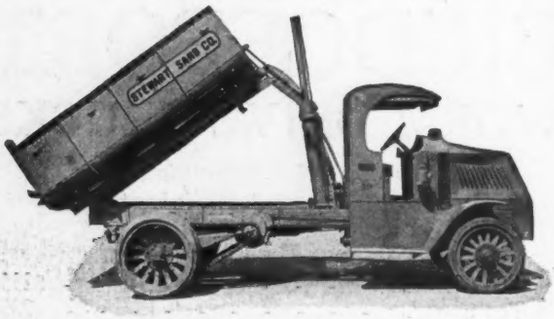
FOR TRUCK AND PASSENGER CAR MANUFACTURERS WHOSE STANDARDS DEMAND THAT EVERY DETAIL OF THEIR EQUIPMENT AS TO WORKMANSHIP, MATERIAL AND DESIGN SHALL BE THE

BEST OBTAINABLE

Snead & Company

Jersey City New Jersey

WE SOLICIT INQUIRIES



Big Sand Dealers

strongly recommend when they buy

Standard Steel Dump Bodies

because they are made on correct engineering principles by men with years of Body-building experience.

Write for circular No. 44 on Steel Dump Bodies and Hoists—or better yet—send specifications for estimates.

Standard Steel Works

Successors to the Ell-Kay Mfg. Co.

1722 Tracy **Kansas City, Mo.**

S. W. Distributors Woods Hydraulic Hoist
Made by Hydraulic Hoist Mfg. Co., St. Paul, Minn.

ADAMS AXLES

Represent Advanced Thought in Axle Construction

Adams Axle Company

Findlay, Ohio

Detroit Office: 1401 Kresge Building
W. D. Rockwell, Mgr.

A

Steel Cabs for Greater Service

A complete line of open seats and dashes, semi-closed and fully closed cabs for motor trucks, in steel construction of the highest standard.

Sheet Steel Products Co.

MICHIGAN CITY, IND.

Where the Extra Cost Goes

Careful fitting, adjusting, running-in, testing, rigid inspecting—that tells the story of the slightly higher price of WISCONSIN. They leave the factory with every working part adjusted to the thousandth of an inch—*ready to run.*

That means a WISCONSIN with a higher initial price but an upkeep so low that its ultimate cost is exceptionally low.

Specifications and booklet, "Honors Wisconsin Has Won," on request

Better Valves

Wisconsin inlet valves are of chrome nickel steel and exhaust valves are of tungsten steel. Valve springs easily removed. Guides are very long.

Wisconsin Motor Mfg. Company

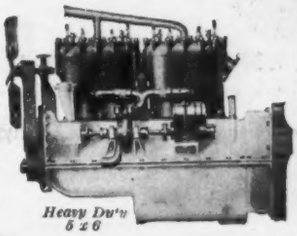
Sta. A, Dept. 320 Milwaukee, Wis.

Distributors:

New York Branch: T. M. Fenner, Factory Representative, 21 Park Row, New York, N. Y.

California Distributor: Earl P. Cooper, Co., Los Angeles, Calif.

Northwest Distributor: Chandler-Dunlap Co., Seattle, Wash.



Heavy Du'ty 6 x 6

Wisconsin

CONSISTENT

FOR giving maximum mileage and the greatest measure of protection to loaded trucks, Fisk Truck Tires are unsurpassed. They save money for you.

FISK

TRUCK TIRES

Jackson

FOUR WHEEL DRIVE TRUCKS

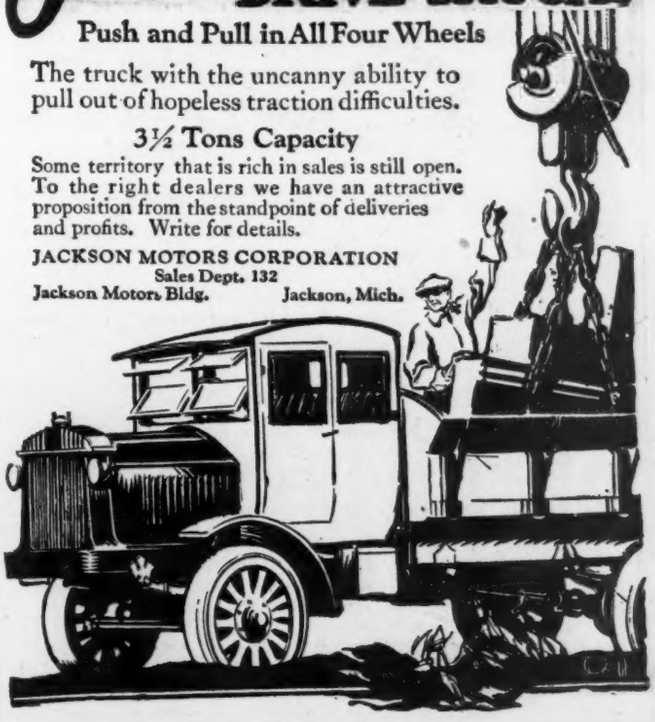
Push and Pull in All Four Wheels

The truck with the uncanny ability to pull out of hopeless traction difficulties.

3½ Tons Capacity

Some territory that is rich in sales is still open. To the right dealers we have an attractive proposition from the standpoint of deliveries and profits. Write for details.

JACKSON MOTORS CORPORATION
Sales Dept. 132
Jackson Motors Bldg. Jackson, Mich.



DETROIT TRAILERS

REVERSIBLE TRAILERS

For Motor Trucks and Tractors, also Pole, Semi- and Passenger Car Trailers.
Special dropped frame trailer with low gravity dump body for public work.
The best tracking and backing trailers in the market.
Take an agency and be happily prosperous.

Send for particulars

DETROIT TRAILER CO.
35 JOS. CAMPAU AVE. DETROIT, MICHIGAN
Branch for Canada: Walkerville, Ont.

United States Motor Trucks
FLOATING POWER PLANT

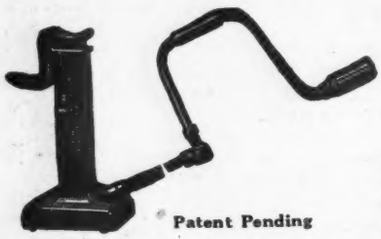
"As Good as the Name"

Seven models—five worm drive —two with Clark Axles—1½ to 6 tons capacity.

The United States Motor Truck Company
Incorporated
Cincinnati Ohio

ARROW GRIP
NON-SKID CHAINS FOR SOLID TIRE VEHICLES
Reg. U. S. Pat. Off.

ROLLER BASE JACK



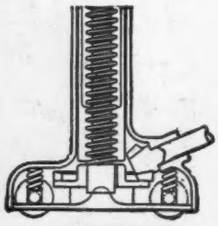
Patent Pending

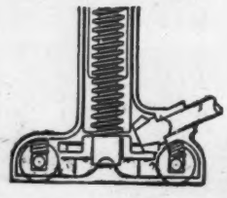
The Jack That *Wheels* Under the Car and is *Handle-Controlled*

The Arrow Grip Jack overcomes the car owner's chief objection to old-style jacks — the necessity of climbing underneath the car to adjust the jack in position with consequent back-breaking effort and soiling of clothes and hands.

For the Arrow Grip Jack operates on a roller base, enabling the operator to ACTUALLY WHEEL IT BENEATH THE CAR by means of the long extension handle.

The wheels depress into the base and the jack is raised. The weight is balanced in the base—no danger of toppling over.





Its demonstrable superiority makes sales easy.

Its exclusive features make repeat orders certain.

Its tremendous sales appeal assures liberal profits.

ARROW GRIP MFG. CO., INC.
Glens Falls, N. Y.

Replacement Springs offering Bigger Profits for Dealers

for all makes of Cars

Only the finest carbon or alloy steel used. These are scientifically heat-treated and tempered in oil. Results in utmost resiliency combined with endurance. Made with or without center bolts.

15,000 Springs Always in Stock

Instant delivery, no matter what make of car. Every spring bears our long-time guarantee of satisfaction or money back quick. For faster service and bigger profits sell Maremont Springs.

Write today for our Catalogue and extraordinary offer

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534-538 West 58th St. New York

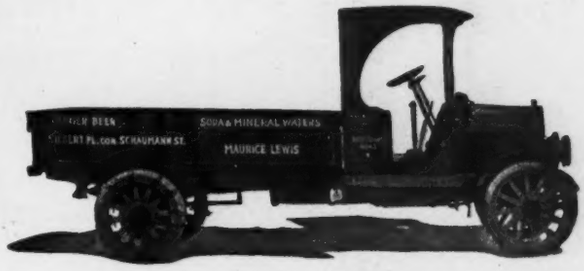
CHAMPION

DROP FORGINGS

Keen competition demands the best quality. If drop forgings enter into the construction of your products, it will pay you to use the best, in other words—

CHAMPION DROP FORGINGS

The Champion Machine & Forge Co.
CLEVELAND, OHIO



1½ Ton Worm-Drive Chassis, $2150.00
2 Ton Worm-Drive Chassis, $2600.00

Buda Motor **Brown-Lipe Clutch**
Bosch Magneto **Timken Worm Drive**
Brown-Lipe Transmission
Timken Bearings Throughout

This high-grade Transmission and Power Plant is mounted on a chassis exceedingly well designed and very substantial.

You will find this a profitable line to handle.

The durability and efficiency of these trucks enable you to secure your customers' repeat orders and build up a clientele of satisfied users.

Sullivan Motor Truck Corporation
Rochester, N. Y.

OLSON
Converting Units
for the
Ford Passenger Car
Ford One-Ton Truck

The Olson Unit makes a one-ton truck of the passenger car. Easily installed. Solid or pneumatic tires on rear wheels.

Price, list, without tires, $85.00.
Price with tires, $150.00.

By the installation of Olson Frame Extension with Side Springs on the Ford truck chassis bodies up to 6 x 15 ft. can be mounted.

Prices from $150.00 to $250.00

Write for Dealer's Proposition

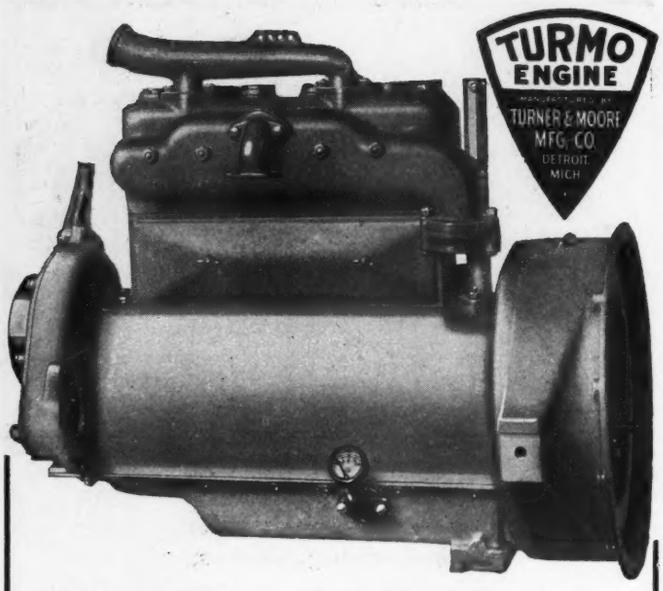
Swedish Crucible Steel Company
Motor Truck Department
DETROIT, MICHIGAN
Direct Factory Branches in New York, Chicago, Indianapolis

The LAW *of*
LUBRICATION

FOR EVERY MACHINE, *of* EVERY DEGREE *of* WEAR *there is* A SCIENTIFIC SINCLAIR OIL *to* SUIT *its* SPEED AND CONSERVE *its* POWER.

Sinclair Refining Co. Chicago

SINCLAIR
OILS



Turmo Four Cylinder Engines

Two Sizes: 3 in. x 5 in. and 3½ in. x 5 in.

Full pressure gear pump lubrication through hollow crankshaft to all bearings.

Highly efficient dry gas hot-spot manifold.

EXCELLENT THERMAL EFFICIENCY
S. A. E. STANDARD MOUNTINGS FOR ALL ACCESSORIES

Turner & Moore Mfg. Co.
32 Merritt Ave.
Sales Offices: 521 Stevens Bldg.
Detroit, Mich.

Converting Reo Speed Wagons Into Three-Ton Trucks

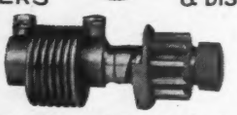
with Detroit Universal Truck Attachments, has been a source of additional profit to many Reo dealers.

Advantages of the converted Speed Wagon over the ordinary 3 ton truck include lower price, greater speed, lower consumption of gas and oil, quicker response to controls, and greater horsepower per hundred pounds than any other truck on the market.

Here is a money-making proposition for Reo dealers. Write for specifications of Detroit Universal Truck Attachments.

CARRIER MOTOR TRUCK CO.
1685 Gratiot Ave. Detroit, Mich.

BENDIX
ECLIPSE
for ELECTRIC STARTERS DRIVE AUTOMATIC ENGAGING & DISENGAGING



194 Motor Car and Truck Builders Use It
ECLIPSE MACHINE CO. ELMIRA N. Y.

STANDARD
UNIVERSAL JOINTS

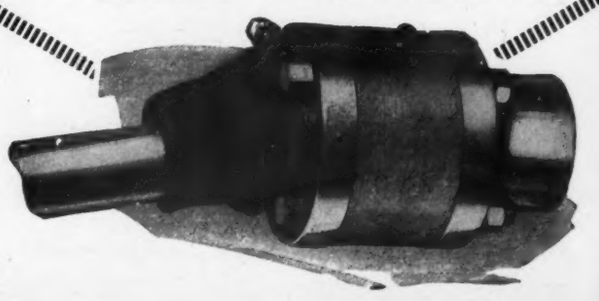
Selected by U.S. Government

Three of the outstanding facts which made STANDARDS the emphatic choice for use on the Government's double "A" trucks:

1. **Scientific accuracy of design—**
2. **Automatic lubrication between movable parts—**
3. **Small number of working surfaces.**

Let us tell you in detail how this long-wearing Universal will greatly increase the efficiency of *your* assembly. *Send us your blueprints.*

The Universal Machine Company
430 Ridge Street Bowling Green, Ohio



MANUFACTURERS AND DEALERS

COMMERCIAL BODY SERVICE

Clark of Oshkosh

SERVICE QUALITY

BODIES AND CABS

ONE TON LINE—CATALOG 20
HEAVY LINE—CATALOG 21

WRITE FOR THEM

J. L. CLARK MFG. COMPANY
OSHKOSH, WIS.

"JASCO" SAFETY FIRST TANK

"JASCO" SAFETY FIRST TANKS

WHETHER you make, buy or sell automobiles you will have an infinite feeling of security and satisfaction if the Jasco Tank is part of their equipment.

It's good to know that the gasoline will stay where put with no chance for leakage, with its consequent dangers. Jasco Tanks insure this.

Made of the finest seamless drawn steel — tested and proved, they will stand the roughest usage.

Send for booklet and detailed information. We are prepared to handle contracts for deep drawn steel work. Send specifications.

JANNEY, STEINMETZ & COMPANY
Main Office, Philadelphia
New York Office, Hudson Terminal Bldg.

GRAHAM BROTHERS
EVANSVILLE, INDIANA U.S.A.

GRAHAM BROTHERS
1½-TON SPEED TRUCK
is sold by the leading automobile dealer in each of fifty important American cities.

COTTA TRUCK TRANSMISSIONS

GEARS ALWAYS IN MESH

COTTA TRANSMISSIONS sell Cotta-equipped trucks!

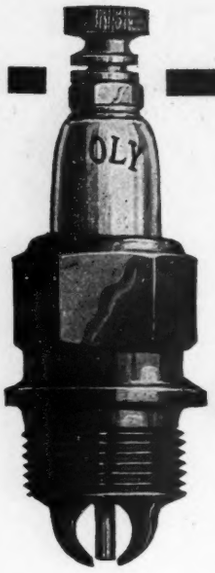
We have proved that fact to many leading truck manufacturers and their dealers. The advantages of Cotta Transmissions are so obvious and convincing that the prospect is often swayed by this one unit alone.

Let us tell you more about Cotta Transmission and the guarantee that goes with it.

Write for Our Literature

Cotta Transmission Company
Largest Exclusive Makers of Truck Transmissions
Rockford Illinois

An Assurance of Dependable Service



The JOLY has done more hard work than any other plug in the world. Under the terrific heat generated by Allied warplanes it lasted longer than any other. Over five million Jolys were used as the standard throughout the war. The

"JOLY"

(Pronounced "JO-LEE")

SPARK PLUG

has a heavy central electrode and two heavy milled integral fingers that furnish extra radiation. It is proof against pre-ignition, compression leaks, carbon and short circuits. It proved this during the war. Get behind the most remarkable spark plug made.

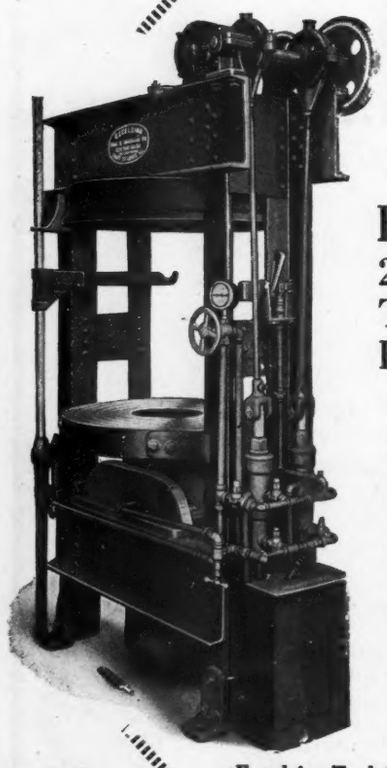
LYONS IGNITION COMPANY
215-219 Fourth Avenue, New York

Now and Always Completely Equipped

OSHKOSH
4-Wheel-Drive Truck

Hauls heavy average "pay loads" because **designed** for pneumatics

Oshkosh Motor Truck Mfg. Co.
Oshkosh **Wisconsin**



Bigger Repair Shop Profits

are assured from the day you install the

EXCELSIOR 225 Ton Tire Applying Press No. 34

Solid tire-applying makes a highly profitable addition to your repair work. As in so many other cases, solid tire replacements may become a greater source of profits than the rest of your business brings.

By all means write for full information now!

Excelsior Tool & Machine Company
East St. Louis, Illinois

Wheels and Rims
For PNEUMATIC TRUCK TIRES

We furnish promptly, any sizes from 32 x 4½ inches to 42 x 9 inches and to fit the hubs of any make of truck.

Send for Price List D

LUVERNE MOTOR TRUCK COMPANY
LUVERNE **MINNESOTA**
Manufacturers of TRUCK PARTS

Dyneto
REGISTERED TRADE MARK

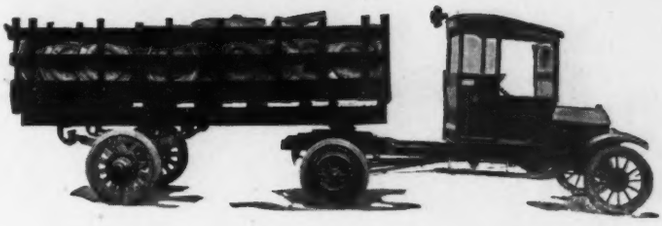
Starting and Lighting Systems

are simple in construction, compact and neat in appearance, and unusually durable — they will outlast most cars. The Dyneto Generators are ball bearing instruments while most other generators used for automotive purposes have only bronze bearings. Dyneto instruments are built to last.

Here are some of the Dyneto-equipped cars and trucks:

Brockway	Geronimo	Monitor
Climber	Hatfield	Norwalk
Comet	Holmes	Piedmont
Commonwealth	Huffman	Stewart
Crow-Elkhart	Jackson	Texas
Dixie	Kalamazoo	Tulsa
Franklin	Luverne	Watson

DYNETO ELECTRIC CORPORATION
SYRACUSE, N. Y.



King Trailers Help Sell Motor Trucks

By doubling the capacity of a motor truck, the King Trailer enables dealers to offer customers a haulage unit at greatly reduced cost.

A 5-ton King Trailer and a 2-ton truck cost only slightly more than half as much as a 5-ton truck—do the work of a 5-ton truck with an operation expense only 10 per cent greater than that of a 2-ton truck.

With an increased production, we are in position to enlarge our distributing organization. Write for our dealer proposition.

King Trailer Company
601 Main Street Ann Arbor, Mich.

King Trailers
Decrease Your Hauling Expense~

THE GUARANTEED KIND

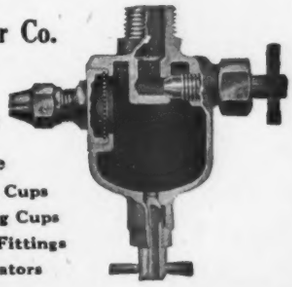
Mr. Truck Maker

Keep the dirt and water from the carburetor by using

Michigan Sediment Traps

1. Screw it into the gasoline tank.
2. The bowl traps the water.
3. The strainer gets the dirt.
4. Clean gasoline goes to the carburetor.
5. The needle valve shuts it off tight.

Michigan Lubricator Co.
Detroit, Mich.



Part of Our Line

Air Cocks	Grease Cups
Drain Cocks	Priming Cups
Gasoline Cocks	S.A.E. Fittings
Oil Cups	Lubricators

MICHIGAN MICHIGAN

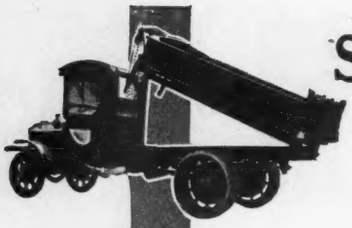
MADE BY MICHIGAN LUBRICATOR CO. DETROIT.

Dart

MOTOR TRUCKS

The "Blue J" Tractor

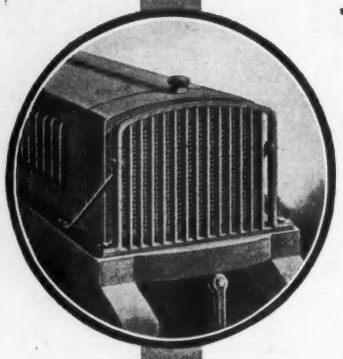
Dart Truck AND Tractor Corp.
WATERLOO, IOWA



Steel Dump Bodies

Your Dump Body requirements handled by specialists. Standardized models—or made precisely to your specifications.

Truck Radiator Guards



You effect greater distribution when your truck is Stewart Radiator-Guard Equipped. Our Engineering Department will be glad to advise you whether flat bars, channel or angle sections be used.

We can also efficiently supply your steel cab and steel dash needs. Write.

The Stewart Iron Works, Inc.
Cincinnati Ohio

STEWART SPECIALTIES

SUPREMACY

in the Class of 1 Ton and 1½ Ton Models

The rise of Napoleon Motor Trucks in 1 and 1½ ton capacities is simply the logical result of sheer mechanical merit and perfect performance. Ample in power, economical in operation, Napoleon Trucks combine extraordinary qualities at an amazing price. Send for complete descriptions of Napoleon Trucks, and compare these features with designs found in trucks around $2000. The 1 ton Napoleon sells for $1285.

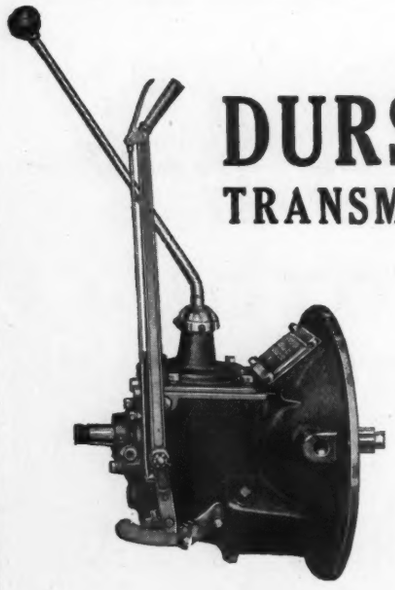
These features have been designed by men with 15 years' experience in truck engineering.

INVESTIGATE THE NAPOLEON DEALERSHIP

Napoleon Motors Company
Traverse City, Michigan

Export Sales Department
American Motors, 100 Broad St., New York City
Pacific Coast Representative
F. E. Gerlinger, Santa Marina Bldg., San Francisco, Cal.

DURSTON TRANSMISSIONS

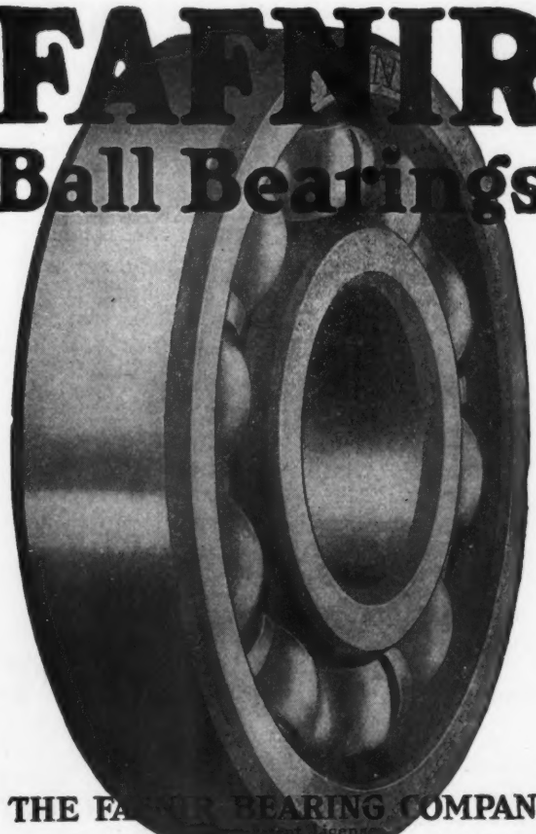


With our capacity doubled during the past few months, we are now in large production on transmissions suitable for trucks up to one-ton capacity or speed wagons.

Our present designs and production methods are the result of years of development. We are in a position to deliver transmissions that are RIGHT in every particular. Your inquiries are solicited.

DURSTON GEAR CORPORATION
SYRACUSE, N. Y.

FAFNIR Ball Bearings



THE FAFNIR BEARING COMPANY
New Britain, Conn.

DETROIT Office, 752 David Whitney Bldg. CHICAGO Office, 1301 Michigan Ave.
CLEVELAND Office, 916-917 Swetland Bldg.

THIS tag is the sign of the "Tenth Year Federal." It is attached to every Federal truck purchased this year and is significant of the experience and responsibility of a company that, in the past ten years, has produced more than 50,000,000 dollars worth of successful motor trucks.

FEDERAL MOTOR TRUCK CO.
DETROIT, MICHIGAN

Tanks and Other Quality A.B.&B. Sheet Metal Parts

For Quality Trucks

The grinding wear of daily truck operation speedily searches out the weak spots in your truck assembly.

Your Tanks, Hoods and Fenders will always be the *strong* parts if they are made by the A. B. & B. Sheet Metal Works—

Because Our Years of Experience Have Taught Us How

And they will retain their style and handsome appearance indefinitely.

May we show you samples of stock accompanied by our estimates? Send us your blueprints.

A. B. & B. Sheet Metal Works

CHAS. STOLPER, *President*

Fond du Lac Ave. and 33d St.

Milwaukee Wisconsin

FRUEHAUF TRAILERS

Speed Up Your Deliveries Increase Haulage Capacity

A 2 ton truck and 6 ton Fruehauf Semi-Trailer will go over the road at 15 miles per hour.

A 6 ton truck, with full load, will do well to make 10 miles per hour. This same truck will pull a 10 ton trailer and make almost as fast time.

Trailers Double and Treble the Haulage Capacity With an Actual Reduction in Haulage Costs.

The investment for truck and trailer is less; the operating expense is less; and the time saved by trucks and men means economies that add to profits.

Fruehauf Semi-Trailers and Four Wheel Trailers are the Standard of America for efficient Haulage Equipment.

Fruehauf Trailer Co.
1302 Gratiot Ave. Detroit, Mich.

WOOD DETROIT

HYDRAULIC HOISTS and STEEL DUMPING BODIES

Manufactured by

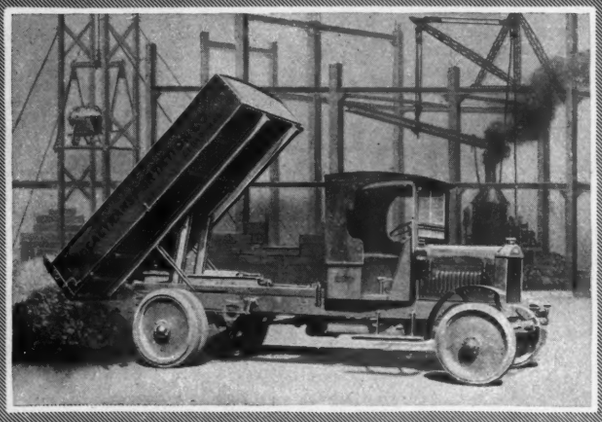
WOOD HYDRAULIC HOIST & BODY COMPANY

Main Factory

1026 Bellevue Ave., Detroit, Michigan

Branches

NEW YORK 721 E. 135th St.
CHICAGO 2911 Indiana Ave.
SAN FRANCISCO 441 Folsom St.



In Service—

The dependable ability to deposit any load exactly where it is wanted is one of the reasons for the popularity of HORIZONTAL HYDRAULIC Dumping Units.

HORIZONTAL HYDRAULIC HOIST CO.

31-37 Twenty-fifth St. Milwaukee, Wis.

Sales and Service Stations:

Chicago, Ill. 3755 Wentworth Ave.

Detroit, Mich. 605 Gratiot Ave.

AETNA

MOTOR TRUCKS

Wisconsin Motor	Cotta Transmission
Sheldon Worm Drive	Ross Steering Gear
Bosch Ignition	Zenith Carburetor

Equipment includes cab, windshield and radiator guard.

"ALWAYS SOMETHING IN RESERVE"

Aetna Motors Corporation of New York

617 West 57th St., New York City

Write or telegraph for information regarding desirable territory still open for dealers.

1½ Ton	3½ Ton
2½ Ton	5½ Ton

COUNTERBALANCED

PARK

CRANKSHAFTS

Patented July 10, 1917

We have shipped 111,802 Counterbalanced Crankshafts up to August 5, 1920

THE PARK DROP FORGE COMPANY

Cleveland, O.

SPECIFY

Fahrig Metal

The Best Bearing Metal on the Market

A special process tin base, copper-hardened alloy for crankpin and crankshaft bearings. Uniform and homogeneous. Used like a regular babbitt metal, but has superior anti-friction qualities and great durability.

The only one we make. The only ones that make it.

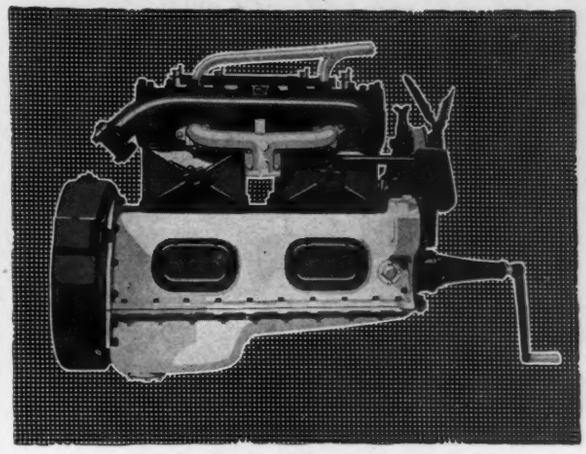
FAHRIG METAL COMPANY

34 COMMERCE STREET, NEW YORK

Wilson

"That's Haul"

J. C. WILSON COMPANY
Detroit Michigan



Waukesha
TRADE MARK

HIGH TORQUE MOTORS

(Maximum Pull at Usable Speed)

An ever increasing number of automotive equipment manufacturers are assuring the future of their product by specifying WAUKESHA HIGH TORQUE MOTORS as their chief unit.

WAUKESHA MOTOR COMPANY
WAUKESHA, WISCONSIN
The World's Largest Builders of Tractor and Truck Motors Exclusively

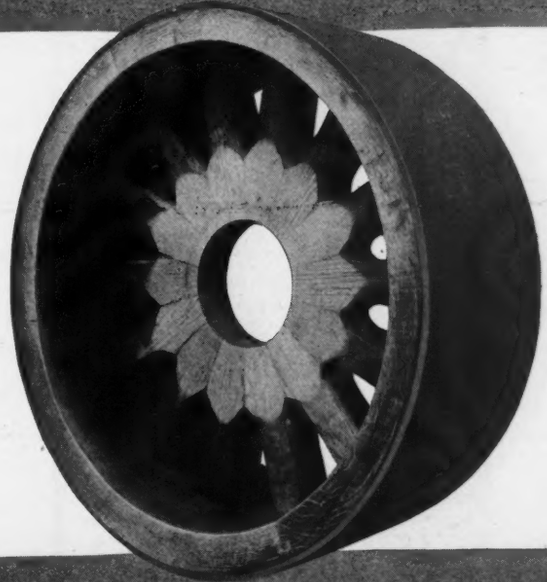
Quick Sales Satisfied Customers

Archer Steel Dump Body and Hand Hoist

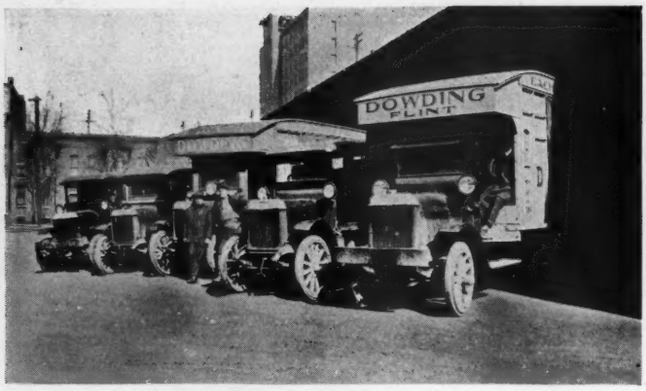
For contractors. For grain men and coal men. For bulk deliveries of all kinds. This equipment speeds deliveries—only 2½ minutes to dump a 5-ton load. No upkeep expense—everlasting body. Write for prices and details.

ARCHER IRON WORKS
2442 W. 34th Place Chicago
Makers of the Archer End-Discharging Concrete Mixer

MUNCIE WOOD WHEELS



STAND ALONE
MUNCIE WHEEL COMPANY
MUNCIE-IND.



150,000 MILES

Still on the job day in and day out after 150,000 miles of hard work on long distance hauls over country roads.

The Dowding Truck and Transfer Company, Flint, Michigan, are well satisfied with this performance by their first Union Truck.

As their business has demanded more truck equipment they have placed repeat orders for Union Trucks.

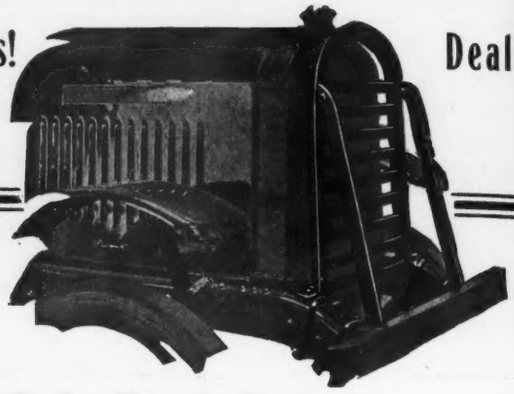
This is just one example of how Union Performance brings repeat orders.

Ask About Our Agency Proposition

UNION MOTOR TRUCKS

UNION MOTOR TRUCK COMPANY
BAY CITY, MICHIGAN

Jobbers! Dealers!



Sell the Truck Owner Uninterrupted Working Days

That's what selling him the WARMAN RADIATOR GUARD means—you actually sell him uninterrupted working days.

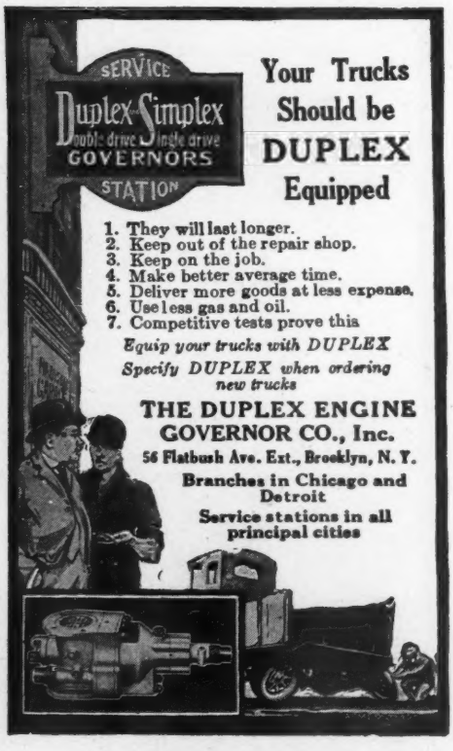
His truck may meet with a head-on collision—but with the powerful WARMAN efficiently protecting the radiator—the weakest member of the truck assembly—the truck will come out unscathed.

The shock of the impact may bend the forward braces, but the WARMAN patented construction will pull the Guard itself *away* instead of being forced back on the radiator.

DEALERS: You will be doing the truck owners of your locality a very great service by pointing out the WARMAN'S big money-saving advantages. Write your Jobber or direct to us for full particulars.

THE FUNDAMENTAL CORPORATION
270 Union Avenue BROOKLYN, N. Y.

The WARMAN RADIATOR GUARD



Your Trucks Should be DUPLEX Equipped

1. They will last longer.
2. Keep out of the repair shop.
3. Keep on the job.
4. Make better average time.
5. Deliver more goods at less expense.
6. Use less gas and oil.
7. Competitive tests prove this

Equip your trucks with DUPLEX
Specify DUPLEX when ordering new trucks

THE DUPLEX ENGINE GOVERNOR CO., Inc.
56 Flatbush Ave. Ext., Brooklyn, N. Y.
Branches in Chicago and Detroit
Service stations in all principal cities

Obenberger

Honest Value—Clear Through

is the reason for the popularity of Obenberger drop forgings with recognized leaders in the automotive industry. We specialize on Obenberger Forgings for automobiles, trucks and tractors. Get our quotations.

John Obenberger Forge Co.
West Allis Milwaukee, Wis.

Forgings

S-M-C

ASBESTOS S-M-C BRAKE LINING

Asbestos Brake Lining

PLAY IT SAFE!

when the car owner—doubting whether his brakes will hold—comes to you for judgment.

Some incident of which you know nothing has raised that doubt.

So play it safe; see his Safety Made Certain. Advise immediate replacement with the best, most dependable asbestos lining. Then make your advice good with S-M-C—its use means

Safety Made Certain

STAYBESTOS MFG. CO.

5523 Lena Street Philadelphia, Pa.

The Modern Factory, devoted exclusively to the manufacture of brake and transmission linings

DENBY MOTOR TRUCKS

IN those kinds of hauling where roads and loads and weather conspire to destroy a truck in its very prime, Denby lasts and *lasts* and *LASTS!*

Denby Motor Truck Co.
Detroit, Mich.

DENBY MOTOR TRUCK CO
DETROIT, MICHIGAN

WIZARD VALVELESS

Power-Driven Tire Pumps

Simplicity

Of Wizard design, eliminates all troublesome features of the valve type pumps with their multiplicity of parts and their necessary adjustments and repairs.

There are only three moving parts in the Wizard Pump and for its service-life no adjustments, renewals or repairs are necessary. A turn of the grease cup before starting is the only attention needed.

As equipment on your chassis it will end your tire inflation troubles, and day in and day out it will deliver maximum pressure even under the severest and most adverse conditions.

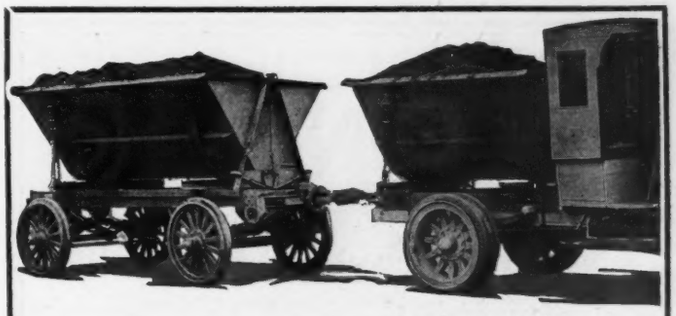
Immediate deliveries of all models. Literature sent upon request.

Sundstrom Manufacturing Co.

Successors to Rex Machine Co.

Shields Avenue at 32nd St. Chicago, Ill.

Detroit Office, Garfield Building



Low Operating Cost

GRAVITY DUMP BODIES

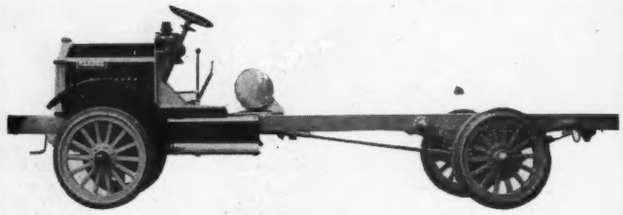
Manufactured Under the Winsor Patents

Let Us Estimate on Your Requirements

TRANSPORTATION EQUIPMENT CO., Inc.

Manufacturers—Transportation Engineers

1685 Gratiot Avenue Detroit, Michigan



Units You Have Faith in

Herschell-Spillman Motor, Zenith Carburetor, Berling Magneto, Pierce Governor, Torbensen Axles.

Parts of such high calibre throughout the assembly proclaim, to you and your customers, the sterling worth of the KEARNS Truck.

Backed by a 48 year old organization which is thoroughly sold on the idea of Service to its Dealers and KEARNS owners.

Our Sales Plan Will Interest You. Write

¾, 1½ Ton Models

The Kearns-Dughie Motors Corpor'n
Danville, Pennsylvania

KEARNS

THE
GENERAL
CORD TRUCK TIRE

—Goes a long way to make friends

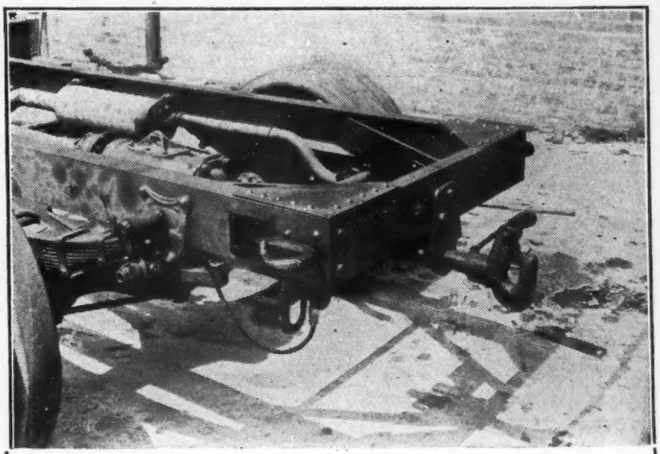
Built in Akron, Ohio, by
The General Tire and Rubber Company

FOUNDRY FOR SALE

Pontiac, Mich.

within twenty-five miles of Detroit, on good concrete road, good rail facilities. Fully equipped for aluminum, brass and bronze casting work and could readily be converted to grey iron. Fifteen thousand square feet of floor space. One-story concrete block construction built about two years ago. Four acres of land. Plant is centrally located and labor conditions are good. Will sell with or without equipment. For particulars and price, write:

DRAWER 47, SYRACUSE, N. Y.



MANSFIELD TRAILER OR TOWING ATTACHMENTS, Types "E" and "G," can be applied to any truck in one hour or less. It is only necessary to drill seven 11-16" holes, and all the tools required are a breast drill and wrench.

MANSFIELD STANDARD RADIATOR GUARDS, Types "A," "B" and "C," have been "LISTED AS STANDARD" by the Underwriters' Laboratories. We are handling with the National Automobile Underwriters' Conference in an effort to secure reduction in collision insurance for all trucks equipped with our guard.

MANSFIELD COMBINATION FRONT BUMPER AND TOW HOOKS, Type "I," for trucks with curved or gooseneck frames.

MANSFIELD HAND FORGED TOW HOOKS, Type "D," can be used on front and rear of trucks.

We also manufacture Steel Dump Bodies, Steel Stake Bodies, Hand Hoists and complete DUMPING UNITS for all small trucks.

Write for Catalog

MANSFIELD STEEL CORPORATION
Detroit, Michigan

We offer the services of our engineers in assisting designers on layouts, involving the use of Thrust Ball Bearings in any type of machine where Thrust Ball Bearings can be used.

Our broad experience covers many years.

We are ready to serve you at any time.

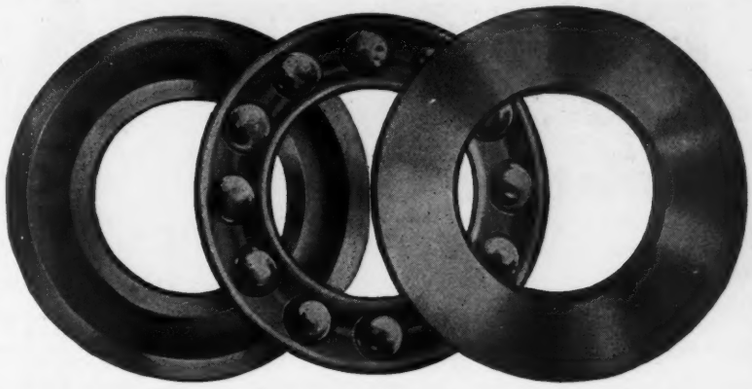
We are prepared to manufacture Thrust Ball Bearings to your requirements.

DROP FORGINGS

THE BEARINGS CO. OF AMERICA

Lancaster Penna.

Western Sales Office
1012 FORD BUILDING, DETROIT, MICH.



SUPERIOR STAMPINGS——————FAULTLESS FORGINGS

FOR THE

TRUCK—TRACTOR—AUTOMOBILE—BUGGY—AEROPLANE

INCLUDING

FENDER IRONS, BOTH FORGED AND STAMPED—STEP HANGERS—CHASSIS IRONS

COMPLETE FITTINGS FOR TRUCK TOPS—*SPECIAL WORK*

SPLENDIDLY EQUIPPED FOR BIG BUSINESS IN BIG QUANTITIES

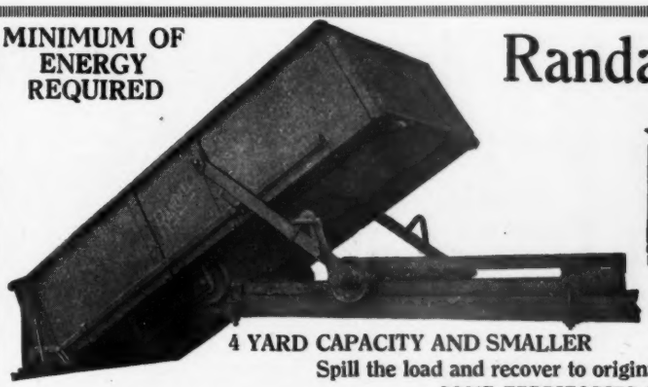
SEND US YOUR INQUIRIES

THE BREWER-TITCHENER CORPORATION
CORTLAND, NEW YORK

MINIMUM OF ENERGY REQUIRED

Randall Steel Dumping Bodies

IMMEDIATE DELIVERIES



4 YARD CAPACITY AND SMALLER 2 TO 4 REVOLUTIONS OF CRANK DUMP THE LOAD

Spill the load and recover to original position in less time than any other dumping device

SOME TERRITORIES STILL OPEN FOR AGGRESSIVE DEALERS

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in stock and to order

For Block, Roller and High Speed Silent Chains
New Catalog

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Control Sets Universal Joints

ALL TYPES AND SIZES

Send for Descriptive Matter

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DETROIT OFFICE: LONNEY & CARMICHAEL, 967½ WOODWARD AVE.
SAN FRANCISCO OFFICE: S. C. KYLE, RIALTO BUILDING

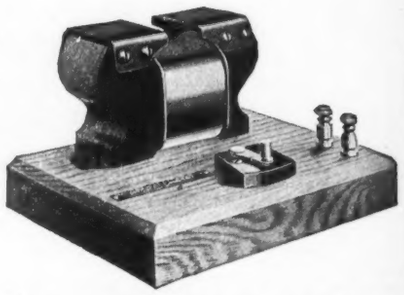
"Attracting and holding 250 pounds of girls"

NIEHOFF MAGNETIZER

This is a new type of Magnetizer, based upon scientific and economical principles. You could not get a better outfit at any size or price. It is guaranteed to fully recharge all makes of magnets, such as are used on automobiles, trucks and tractors. It has a pulling capacity of 250 pounds by test. The Niehoff Laminated Magnetizer is constructed to last a lifetime. The parts that are subject to wear, after long usage, can easily be replaced at a small cost.

Get this outfit and know that you are equipped with the finest and most efficient Magnetizer made.

PAUL G. NIEHOFF & CO., INC.
244 E. Ohio St. Chicago, Ill.



Made in two types for 6-volt storage battery and for 110 D. C. Current

SANS PEUR — Lauraine — SANS REPROCHE
MAGNETO
MADE IN U. S. A.

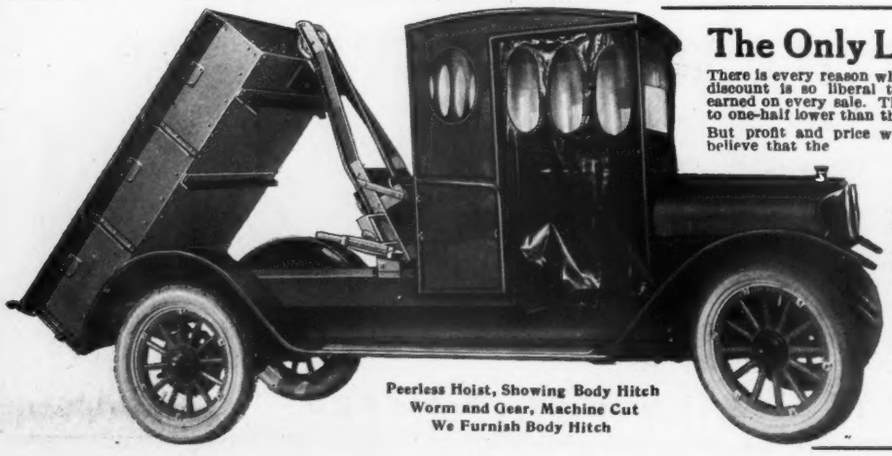
"IT NEVER FAILS"
High Tension
Dust-Waterproof

"IT NEVER FAILS"
Adopted by the Allied Governments

QUICK REPAIR SERVICE

The construction of the Lauraine is the most advanced idea yet perfected in magneto design. Divided into 14 divisional units, easily disassembled and replaceable, the necessity of removing intricate parts is avoided. Lauraine Service consists of supplying an entirely new unit in place of the one needing repairs. It's easy for a mechanic to remove a unit—it's difficult for him to take apart an entire magneto. Speed—Economy—Service are accomplished by the Lauraine construction.

LAURAINE MAGNETO COMPANY, INC.
13th Street and Ely Avenue LONG ISLAND CITY, N. Y.



Peerless Hoist, Showing Body Hitch
Worm and Gear, Machine Cut
We Furnish Body Hitch

The Only Logical Choice for Dealers

There is every reason why the Peerless is the logical hoist for you to sell. The discount is so liberal that your time is well paid for and a handsome profit is earned on every sale. The price appeals to your customers, as it is from one-third to one-half lower than the cost of other hoists.

But profit and price would make little appeal if you did not conscientiously believe that the

Peerless Hand Hoist

was superior in mechanical perfection and operation to any other lifting apparatus made. Rest content! It is *the only* efficient hoist that can be attached to either steel or wood bodies. It is *the only* efficient hand hoist that sells at a moderate price. These are pretty strong reasons why you should consider its sales possibilities. An operator can hoist from one to four tons in from one to four minutes. What more could be required on speed!

You are getting calls for hoists and are often undecided as to *which* hoist to recommend. We'll tell you *why* the Peerless fills the bill every time. Will you let us?

Alsteel Bodies Guaranteed to Take Care of 100% Overload Under Rough Usage

The Auglaize Motor Car Company
New Bremen, Ohio

A BARGAIN IN TIRES

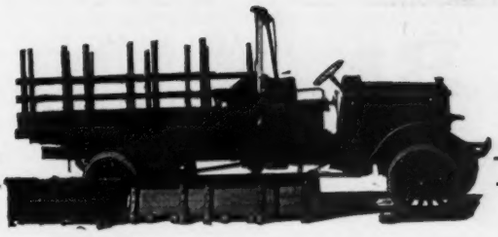
LIGHT TRUCK or TRAILER EQUIPMENT

Manufacturer has stock of approximately 1,000 32x3½ Clincher Cushion Tires that will be sold at a bargain.

These tires would make good equipment for a light truck or trailer. They are first class. Offered at a low price, as this size is no longer manufactured by us.

For Full Information and Price

ADDRESS "BARGAIN"
Care The Commercial Car Journal Philadelphia



SIMPLEX **Four Bodies in One**

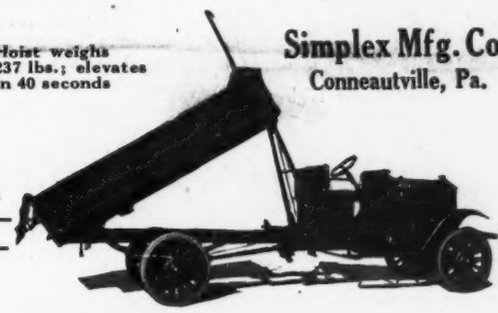
Think of the selling possibilities of a truck body which is four bodies in one.

Think back on the truck sales you would have saved could you have offered your prospect such a four-in-one proposition as the Simplex.

Now is your chance to cash in on every selling opportunity that rises wherein a Simplex—and only a Simplex—will help you swing the truck sale. Write for full particulars *at once*.

Hoist weighs 237 lbs.; elevates in 40 seconds

Simplex Mfg. Co.
Conneautville, Pa.



THE HAND MADE TRUCK

KALAMAZOO

1½-2½-3½ Tons Capacity

An opportunity for distributors capable of handling a high-grade motor truck of proven merit.

Write for particulars covering territorial rights, etc.

Kalamazoo Motors Corporation
(MOTOR TRUCK DIVISION)
Kalamazoo, Mich. U.S.A.

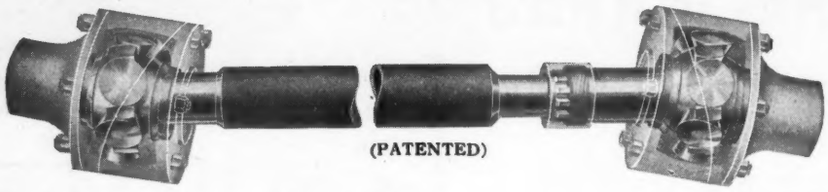
Wyman-Gordon

Guaranteed Forgings

"STANDARD OF THE INDUSTRY"

WYMAN-GORDON
THE CRANKSHAFT MAKERS
Worcester, Mass. Cleveland, Ohio
Chicago, Ill.

REAM UNIVERSAL JOINTS



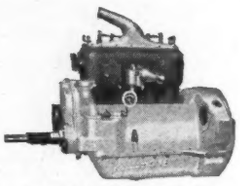
(PATENTED)

Ball and socket and full roller bearing.
Oscillation impossible.
No backlash.
Do not develop velocity variation.
No damage through the agency of end-thrust.
Spline end extends through the ball, providing equal pressure on inner and outer end of ball.
All traces of whip are entirely removed.

No loss of power to deflect.
Perfect relative alignment under all conditions.
No noise—roller bearing.

Positively does not waste lubrication.
Extraordinary long life.
Made entirely from forgings and bar stock.
Unequaled and unqualified service.
Repair shops, dealers, jobbers—ask us about replacement assemblies for any truck or car—all sizes.
Quantity production for manufacturers.
Send for catalog—contains complete detail.

R. S. Manufacturing Co., Kansas City, Missouri **Plant and Works: Dayton, Ohio**



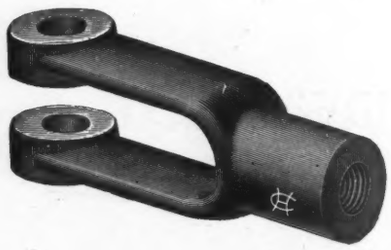
Four-Cylinder Highway Motor 3¾" x 5"

MOTOR efficiency, refinement and satisfaction, multiplied many times through dependable quantity production—this is the service that Highway offers to the automobile industry.

The Highway Motors Co.
Defiance, Ohio

HIGHWAY MOTORS
Successors to G-B&S motors
AUTOMOBILE—TRUCK—TRACTOR

ADJUSTABLE YOKE ENDS
S. A. E. STANDARD

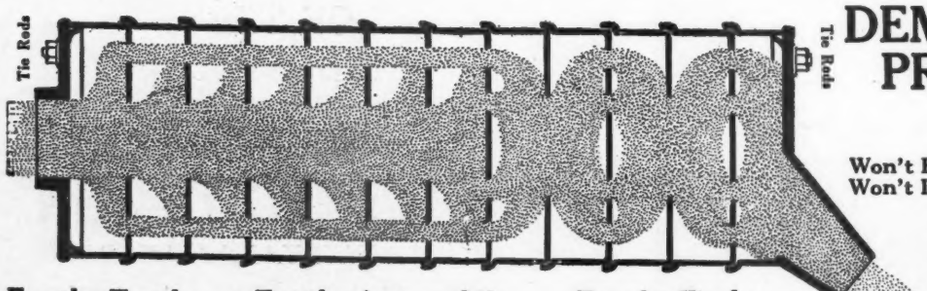


WE make all sizes of Yoke and Rod Ends

Automotive Forgings shown in our *Catalog 14-A*

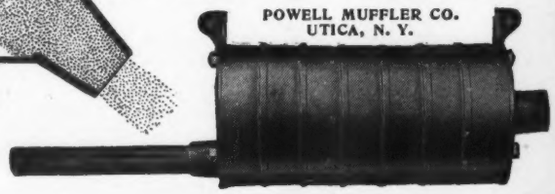
THE CLEVELAND HARDWARE COMPANY
Cleveland, Ohio

PLAIN YOKE ENDS
S. A. E. STANDARD



DEMAND POWELL PRESSED-STEEL MUFFLERS

Won't Blow Up
Won't Leak
No Loss of Power
No Repairing



For the Truck For the Automobile For the Ford

POWELL MUFFLER COMPANY
UTICA, NEW YORK

SCHWARZ WHEELS

Proved Quality Equipment

The indisputable fact that **Schwarz** Wheels are standard equipment on all the leading commercial cars is eloquent testimony to their **proved** quality.

Schwarz Wheels owe their supremacy to the Schwarz Patented Interlocking Spoke Construction, which forms a rigid, immovable center assembly that absorbs vibration—but cannot loosen or get out of shape under the most severe strains.

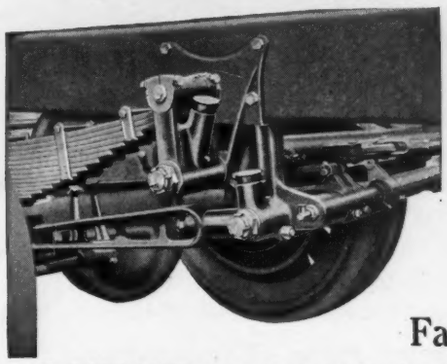
You are **sure** of lasting, completely satisfactory service when you specify Schwarz Wheels.

By all means send for full particulars

NOTE THE WOOD WHEELS EVERYWHERE

The Schwarz Wheel Co.

FRANKFORD **PHILA., PENNA.**



The Old-Fashioned Wick System Fills a New-Fashioned Need

DEVELOPED from the principle of a wick in an oil lamp, the automatic lubrication of the *Ward La France Motor Truck* is the most advanced system of lubrication ever devised. The oil is supplied to the Spring Shackles, Radius Rods, the Brake Mechanism and Drag Link Assembly just as it is needed. None is wasted—it cannot cake like grease and lubrication does not flow when the truck is idle, which is a saving. It will remain lubricated without refilling longer than any other truck on the market.

This Exclusive Lubrication System is a big aid in selling. Send for full particulars about Dealerships.

Model 2B....2½ ton....$3590.00
Model 4A....3½ ton 4490.00
Model 5A....5 ton.... 5490.00

Ward La France Truck Corp.
Elmira, New York, U. S. A.
Desk 13

Announcing

National Steel Products Co.

of

Kansas City, Missouri

Manufacturers of steel dump bodies and hand hoists for all styles of trucks.

Our Engineering Department composed of men with years of experience in body building.

Our new modern equipped factory assures prompt attention to your special requirements.

Your specifications cannot be too exacting—send them to us.

NATIONAL STEEL PRODUCTS CO.

1611-1613 Crystal Avenue

Kansas City, Mo.

C'est *finis!*

This veteran length of TRIPLEXD was discharged by the Irving Garage of Brooklyn, N.Y. not because of defect in old age---none developed--but because it had become too short. ¶ Hard usage forced many a new coupling but never a leak. TRIPLEXD is guaranteed in writing for one year's service, but invariably delivers many times its guarantee. ¶ No gasoline pump can afford any other kind of hose

METAL HOSE & TUBING CO.
INCORPORATED
BROOKLYN, N. Y.
246 TILLARY STREET

TRIPLEXD

XXX GASOLINE HOSE XXX

TRADE MARK REG. U.S. PAT. OFF.

Tool Locked in Position for Removing or Replacing Tire.

K.P. Universal Rim Tool

Price $4.00

The easiest way to remove tires from split rims

Fits all types of cross-cut demountable rims in use today.

Collapses a rim no matter how badly a tire may be stuck to it.

Forces the rim back on the tire again with the utmost ease—even in the case of new tires which are undersized.

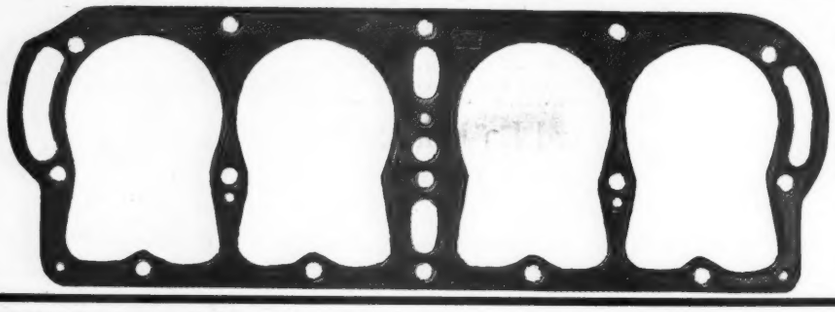
Locks rim collapsed while tire is being removed or replaced.

The K. P. Products Co., Inc.
250 West 54th St., New York

Pacific Coast and Intermountain Representatives:
Norton-Munter Co., 1603 L. C. Smith Bldg., Seattle, Wash.

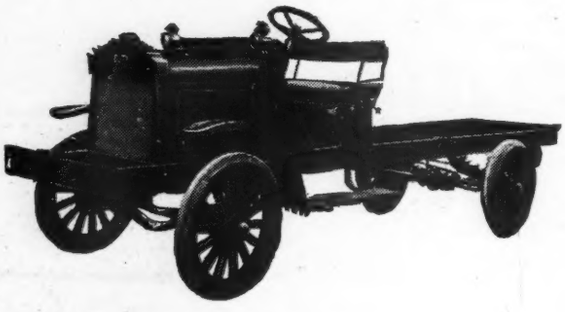
ON ALL GASKET REPLACEMENT JOBS USE

NEVER-LEAK CYLINDER-HEAD GASKETS



Not only are they the best and tightest but they cost less than other good gaskets. There's a Never-Leak gasket for every size and make of truck and passenger car. See that your stock is complete, for service stations report a continued demand for them.

The Fitzgerald Mfg. Co.
Torrington Conn.



THE DUTY TRUCK

A powerful, rugged TWO-TON TRUCK, with overhead valve motor; heavy standard units; S. A. E. specifications.

Chassis, with bumper, tool box, lights, seat and tool equipment. Price $1490 f. o. b. factory.

DUTY MOTOR CO. - - - Greenville, Ills.

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NATIONAL AUTHORIZED SERVICE
Hyatt, Timken and New Departure Bearings

Atlanta	Los Angeles	Seattle	Denver	Philadelphia	Omaha	Brooklyn
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More than 1,000 Authorized Distributors in Other Main Centers

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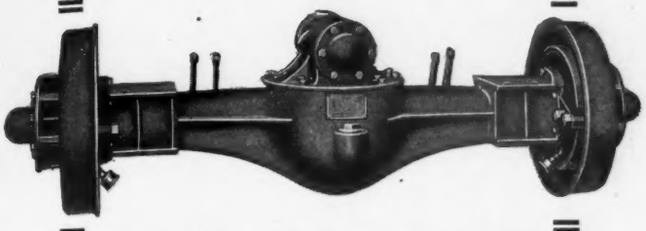


For High-Grade Trucks *Only*

Thirty-five manufacturers of high-grade trucks are using **Wisconsin Axles**, because they are custom built for special requirements.

Manufacturers of quality trucks cannot afford to overlook the very considerable prestige **Wisconsin Axles** will add to their quality products.

1, 1½, 2, 2½, 3½ and 5 ton capacities. The most complete line of quality worm-drive rear axles made in this country.

WISCONSIN PARTS COMPANY
Oshkosh **Wisconsin**

WISCONSIN CUSTOM BUILT AXLES

KISSEL *Custom-Built Six*

"The Aristocrats of Motordom"

6 Models—3 Open and 3 Closed

KISSEL *Motor Trucks* **4 Sizes**

Equipped with Kissel's ALL-YEAR Cab for Trucks

Distributors in Principal Cities
Open Territory Now Being Closed

The ALL-YEAR *Car*

Kissel Motor Car Co.
Hartford, Wis.
U. S. A.

Simplicity and Quality Built Into a Magneto!

THE APOLLO, with fewer parts than any other magneto, represents the utmost in *simplicity and quality*—two attributes absolutely essential to successful commercial car service.

Write for catalog fully explaining the many ingenious refinements of the Apollo Magneto

APOLLO MAGNETO CORP.
95 Grand St. **Kingston, N. Y.**

Now is the Time to Sell

FOLEY
TRACTION RIMS

Now—in the fall time—when motor truck users find the going mighty bad over soft, muddy roads.

Foley Traction Rims will save your customers valuable time—fuel—repair bills.

The broad rims and traction lugs take immediate hold when the rubber tires sink in the miry ground. Easily furnish positive, powerful traction—every time.

Nash Quad Truck Equipped With FOLEY TRACTION RIMS

Write for full particulars regarding this big business building proposition

FOLEY TRACTION RIM COMPANY
827 Hennepin Avenue **Minneapolis, Minn.**

WE FINANCE

AUTOMOBILE AND TRUCK

Time Sales

No Red Tape Necessary

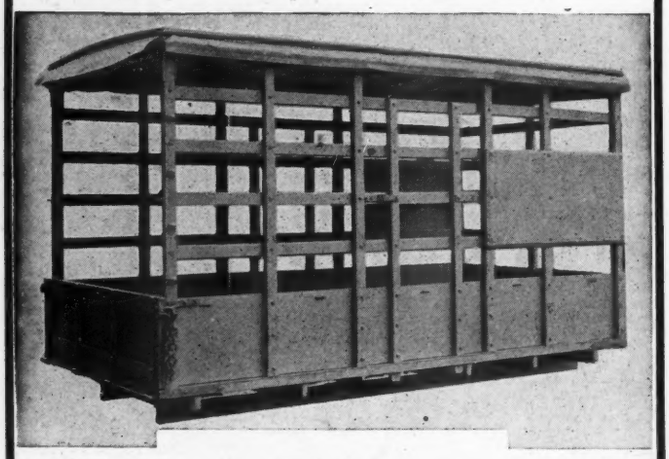
Write for Particulars

Transportation Finance Company, Inc.

Executive Offices
WILDER BUILDING
ROCHESTER, NEW YORK

METROPOLITAN STANDARD TRUCK BODIES

32 Styles IMMEDIATE DELIVERY 1 to 5 Ton



"Made by METROPOLITAN" assures you of quality that will stand rough wear and hard bumps and still give service that you can always rely on — we guarantee it.

Write for Catalogue

METROPOLITAN BODY COMPANY
BRIDGEPORT, CONN.

Oakite Saves $420 and Cleans Carburetor Parts Better

THIS Western carburetor company adopted Oakite materials for cleaning carburetor parts in process of manufacture, and effects a yearly saving of $420.

More important than this saving in cleaning costs is the fact that *better cleaning results* are secured.

In the use of the former cleaning material, insoluble matter clogged the filter screens, retarded the work, and caused much dissatisfaction.

Now the parts come through perfectly clean. Oakite leaves no sediment—makes inspection easier—speeds the work.

May We Serve You Too?

OAKITE

MANUFACTURED BY
OAKLEY CHEMICAL CO.
38 THAMES STREET · NEW YORK

THE SATURDAY EVENING POST
When You See
a Truck with these Torpedo-Shaped Hub Caps
It has Sheldon Axles! The axles
and ball bearings that never need
built on the locomotive axle prin
adjustment during the entire life
ciple of widely-spread bearings
of the truck. Made for trucks
the axles with worm gear dr
from ½- to 5-ton capacity.
SHELDON AXLE &
NG COMPANY, Wilkes-Barre, Pa.
Manufacturers of Sheldon Axles for M
Trucks and Sheldon Springs for Automobiles and Trucks
Sheldon
AXLE
FOR MOTOR TRUCKS

BUYERS' INDEX

This is NOT an index of what manufacturers make, but merely an index of the CONTENTS of both the reading and advertising pages of THIS PARTICULAR ISSUE, and is placed here for the benefit and convenience of our readers

Accelerators
Pledger Appliance Co., Inc. 51

Air Compressors
Rex Machine Co. 275
Sundstrom Manufacturing Co. 275

Anti-Skid & Traction Devices
Daubenspeck Chain Co. 246
Foley Traction Rim Co. 260
Giant Grip Mfg. Co. 196

Anti-Squeak Material
Hide Leather & Belting Co. 203

Asbestos Yarn & Cloth
General Asbestos & Rubber Co. 183

Automobiles Public Service
Tiffin Wagon Co. 152

Axles
Adams Axle Co. 262
American Machine Co. 288
Clark Equipment Co. 95
Columbia Axle Co. 192
Russel Motor Axle Co. ....Inside Back Cover
Sheldon Axle & Spring Co. 285
Timken-Detroit Axle Co. 117
Torbensen Axle Co. 162
Vulcan Motor Axle Co. 225
Walker Axle Co. 260
Wisconsin Parts Co. 283

Axle Housings
Bossert Corporation, The (Pressed Steel) 6
Hydraulic Pressed Steel Co. 197
Parish & Bingham Corporation 143
Sivyer Steel Casting Co. 91

Axle Housing Covers
Parish & Bingham Corporation 143

Ball Cups
Bossett Corporation, The 6

Ball Bearings
Bantam Ball Bearing Co. 256
Bearings Co. of America 277
Fafnir Bearing Co. 270
Federal Bearings Co., Inc 186
Gurney Ball Bearing Co. 248
Norma Co. of America 5
S K F Industries, Incorporated 103
U. S. Ball Bearing Mfg. Co. 207

Balls, Brass & Steel
Hoover Steel Ball Co. 97
S K F Industries, Incorporated 103

Battery Boxes
Globe Machine & Stamping Co. 50

Batteries, Storage & Parts
Barco Battery Co. 47
Electric Storage Battery Co. 151
Ionite Storage Battery Co. 49
Prest-O-Lite Co. 45
Ray Battery Co. 63

Battery Ignition Systems
Westinghouse Electric & Mfg. Co. 247

Bearings & Bushings
Bantam Ball Bearing Co. 256
Bearings Co. of America 277
Bound Brook Oil-less Bearing Co. 133
Doehler Die-Castings Co. 261
Federal Bearings Co., Inc. 186
Gurney Ball Bearing Co. (Thrust) 248
Norma Co. of America (Thrust) 5
Precision Castings Co., Inc. 276
U. S. Ball Bearing Mfg. Co. 207

Bearing Grinding Compounds
M. T. K. Sales Corporation 257

Bearing Metal
Fahrig Metal Co. 272

Bearing Service
Bearings Service Co. 282

Bodies
Acme Motor Truck Co. 41
Archer Iron Works 273
Auglaize Motor Car Co. 278
Automatic Dump Car Co. 256
Babcock, H. H., Co. 123
Clark, J. L., Mfg. Co. 267
Columbia Wagon Co. 244
Columbian Steel Tank Co. 228
Field Mfg. Co. 42
Heil Co. 115
Highland Body Mfg. Co. 195
Lee Loader & Body Co. 239
Mansfield Steel Corporation 276
Martin-Parry Corporation 222
Metropolitan Body Co. 284
National Steel Products Co. 281
Randall Steel Dumping Bodies Co. 277
Simplex Mfg. Co. 279
Standard Steel Works 262
Stewart Iron Works, Inc. 270
Transportation Equipment Co. 275
Wood Hydraulic Hoist & Body Co. 271

Brake Bands
Bossett Corporation, The 6

Brake Drums
Bossett Corporation, The 6
Hydraulic Pressed Steel Co. 197
Parish & Bingham Corporation 143

Brake Lining
General Asbestas & Rubber Co. 183
Johns-Manville, H. W., Co. 156, 157
Multibestos Co. 170
Raybestos Co. 47
Staybestos Mfg. Co. 275
Thermoid Rubber Co. 127, 145
Vogt Manufacturing Co. 48

Bronze & Brass Castings
Doehler Die-Castings Co. 261

Bumpers
Mansfield Steel Corporation 276

Burning-In & Running-In Machines
Jansen, Theo. W. 64

Cable (Ignition, Starting & Lighting)
Packard Electric Co. 254

Cabs
Babcock, H. H. Co. 123
Clark, J. L., Mfg. Co. 267
Detroit Weatherproof Body Co. 260
Highland Body Co. 195
Sheet Steel Products Co. 263

Camshafts
Muskegon Motor Specialties Co. 261

Carburetors & Outfits
Miller, H. A., Mfg. Co. 46
Stromberg Motor Devices Co. 221
Zenith Carburetor Co. 217

Castings
(See Aluminum, Bronze & Brass, Iron Castings, Die Castings, Malleable & Steel Castings)

Cement
General Asbestos & Rubber Co. 183
Johns-Manville, H. W., Co. 156, 157

Charging Apparatus
Acme Electric & Mfg. Co. 66

Chains
Cullman Wheel Co. 277
Rowe Calk & Chain Co. 238

Chain Blocks
Ford Chain Block Co. 250

Chucks
S K F Industries, Incorporated 103
Service Station Equipment Corp. 64

Clamps
Rowe Calk & Chain Co. (Spoke) 238

Cleaning Compounds
Oakley Chemical Co. 284

Clutches
Detlaff, A. J., Co. 249
Fuller & Sons Mfg. Co. 201
Hartford Automotive Parts Co. 236
Merchant & Evans Co. 248

Clutch Facings
General Asbestos & Rubber Co. 183
Hide Leather & Belting Co. 203

Clutch Parts
Curtis Clutch Disc Co. 259

Cocks
Jorgensen Mfg. Co. (Pet) 146
Michigan Lubricator Co. (Air, Drain & Gasoline) 269

Commercial Cars (Electric)
Oneida Motor Truck Co. 224
Ward Motor Vehicle Co. 190

Commercial Cars (Gasoline)
Ace Motor Trucks 218
Acme Motor Truck Co. 253
Advance-Rumely Thresher Co. 35
Aetna Motor Corporation of New York..272
American Commercial Car Co. 249
American La France Fire Engine Co. 124
American Motor Truck Co. 220
Armleder, O., Co. 218, 219
Atlas Truck Corporation 168, 169
Atterbury Motor Car Co. 93
Autocar Co. 16
Available Truck Co. 187
Avery Co. 36
Bessemer Motor Truck Co. 198
Bridgeport Motor Truck Co. 261
Carrier Motor Truck Co. 266
Clydesdale Motor Truck Co. 141
Dart Truck & Tractor Corp. 269
Day-Elder Motors Corporation 121
Defiance Motor Truck Co. 4
Dependable Truck & Tractor Co. 251
Denby Motor Truck Co. 275
Duplex Truck Co. 206
Duty Motor Co. 282
Fageol Motors Co. (of Ohio) 173
Federal Motor Truck Co. 271
Garford 105
Gary Motor Truck Co. 230
Graham Brothers 267
Grant Motor Car Corporation 260
Harrisburg Mfg. & Boiler Co. 165, 166
Independent Motor Truck Co., Inc. 234
International Harvester Co. of America, Incorporated 149
International Motor Co. 159
Jackson Motors Corporation 263
Kalamazoo Motors Corporation 279
Kearns-Dughie Motors Corporation 276
Kentucky Wagon Mfg. Co., Incorporated.161
Keystone Motor Truck Corporation 200
Kissel Motor Car Co. 283
Larrabee-Deyo Motor Truck Co., Inc. 238
Lewis-Hall Motors Corporation 204
Luedinghaus Espenschied Wagon Co. ..242
Maccar Truck Co. 215
Master Trucks, Inc. 171
Minneapolis Steel & Machinery Co. ..39, 184
Moline Plow Co. 134, 135
Napoleon Motors Co. 270
Nash Motors Co. 116
Nelson Motor Truck Co. 107
Noble Motor Truck Corporation 241
Oneida Motor Truck Co. 224
Oshkosh Motor Truck Mfg. Co. 268
Packard Motor Car Co. 38
Parker Motor Truck Co. 209
Patriot Motors Co. 262
Pierce-Arrow Motor Car Co. 163
Rainier Motor Corporation 291
Republic Truck Sales Corporation Front Cover
Reynolds Motor Truck Co. 136
Rowe Motor Mfg. Co. 14
Sanford Motor Truck Co. 113
Schacht, G. A., Motor Truck Co. 147
Selden Truck Corporation 8
Service Motor Truck Co. 213
Signal Motor Truck Co. 110
Standard Motor Truck Co. 202
Sterling Motor Truck Co. 40
Stewart Motor Corporation .....Back Cover
Sullivan Motor Truck Corporation 265
Thomart Motor Co. 139
Tiffin Wagon Co. 152
Titan Truck Co. 259
Tower Motor Truck Co. 256
Traffic Motor Truck Corporation .131, 132
Transport Truck Co. 176
Traylor Engineering & Manufacturing Co. 174
Union Motor Truck Co. 274
United States Motor Truck Co. 264
Walter Sales Co. 216
Ward La France Truck Corp. 281
Wilson, J. C., Co. 273
Winther Motor Truck Co. 128

Controls & Control Sets
Baker Gun & Forging Co. 278

Crankshafts
Park Drop Forge Co. 272
Union Switch & Signal Co. 234
Wyman-Gordon Co. 279

Curb Outfits (Gasoline)
Bowser, S. F., & Co., Inc. 193
Tokheim Oil Tank & Pump Co. 45, 129

Current Rectifiers
Acme Electric & Mfg. Co. 66

Cushion Wheels
Sewell Cushion Wheel Co. 265

Cylinder Reboring & Regrinding
Modern Electric & Machine Co. 258

Die Castings
Doehler Die-Castings Co. (Bronze-Back Babbitt Bearings) 261

Differentials
Brown-Lipe-Chapin Co. 194
Cleveland Worm Gear Co. 239
New Process Gear Corporation 154
Nogrady Differential Co. 44

Drilling Machines
Black & Decker Mfg. Co. 66

BUYERS' INDEX—Continued

Dumping Units
Horizontal Hydraulic Hoist Co. 272

Dust & Mud Shields
Hydraulic Pressed Steel Co. 197

Electric Lighting Systems
(See Starting & Lighting Outfits)

Electric Testing Instruments
Niehoff, Paul G., & Co., Inc. 278

Enameled Goods
O'Bannon Corporation 243

Engines
Buda Co. 101
Continental Motors Corporation 177
Herschell-Spillman Motor Co. 122
Highway Motors Co. 280
Le Roi Co. 289
Lycoming Motors Corporation 167
Midwest Engine Co. 212
Turner & Moore Mfg. Co. 266
Waukesha Motor Co. 273
Weidely Motors Co. 294
Wisconsin Motor Mfg. Co. 263

Engine Pans
Parish & Bingham Corporation 143

Engine Stands
Portable Tool Supply Co. 66

Equipment & Parts for Ford Cars
American Taximeter Co. 257
Babcock, H. H., Co. 123
Columbia Wagon Co. 244
General Asbestos & Rubber Co. 183
Martin-Parry Corporation 222
Powell Muffler Co. 280
Raybestos Co. 47
Rylander, J. Emory 61
Service Station Equipment Corp. 64
Swedish Crucible Steel Co. 265
Tokheim Oil Tank & Pump Co. 129
Veeder Mfg. Co. 250
Vogt Mfg. Co. 48
Wayne Engineering Co. 49

Fabrics (Rubberized)
O'Bannon Corporation 243

Fans
Oakes Co. 153

Fan Belts
Cloud Accessories Corp. 50
Hide Leather & Belting Co. 203

Fenders
A. B. & B. Sheet Metal Works 271
Motors Metal Mfg. Co. 235

Ferro Alloys
Climax Molybdenum Co. 13

Fibre
Delaware Hard Fibre Co. 259
General Asbestos & Rubber Co. 183

Filters (Oil)
Bowser, S. F. & Co., Inc. 193

Financing Companies
Transportation Finance Co., Inc. 284

Fire Apparatus
American-La France Fire Engine Co., Inc.124
Childs, O. J., Co. 180

Fire Extinguishers
Johns-Manville, H. W., Co. 156, 157

Fittings, Brass, Tank, Etc.
Bowen Products Corp. 144
Jorgensen Mfg. Co. 146
Michigan Lubricator Co. 269

Flooring (Ventilating)
Irving Iron Works 243

Forgings
Bearings Co. of America 277
Billings & Spencer Co. 205
Brewer-Titchener Corporation 277
Champion Machine & Forge Co. 265
Cleveland Hardware Co. 280
Obenberger, John, Forge Co. 274
Park Drop Forge Co. 272
Union Switch & Signal Co. 234
Western Drop Forge Co. 130
Williams, J. H. & Co. 242
Wyman-Gordon Co. 279

Frames
Hydraulic Pressed Steel Co. 197
Parish & Bingham Corporation 143
Sharon Pressed Steel Co. 112
Smith, A. O., Corporation 252

Gaskets
Fitzgerald Mfg. Co. 282
General Asbestos & Rubber Co. 183

Gasoline & Oil Storage Outfits
Bowser, S. F. & Co., Inc. 193
Heil Co. 115
Janney, Steinmetz & Co. 267
Tokheim Oil Tank & Pump Co. 129
Trageser, John, Steam Copper Works ...251

Gears & Gear Cutting
Brown-Lipe-Chapin Co. 194
Brown-Lipe Gear Co. 194
Cleveland Worm Gear Co. 239
Cotta Transmission Co. 267
Covert Gear Co., Inc. 253
Detroit Gear & Machine Co. 199
Durston Gear Corporation 270
Fuller & Sons Mfg. Co. 201
New Process Gear Corporation 154
Warner Gear Co. 160
Weeks-Hoffman Co. 258

Generators
Dyneto Electric Corporation 269
Westinghouse Electric Mfg. Co. 44

Governors (Engine)
Duplex Engine Governor Co., Inc. 274
Monarch Governor Co. 181
Pierce Governor Co. 258

Grease & Oil Cups
Bennett Injector Co. 118

Grease & Oil Cups & Guns
Bennett Injector Co. 118
Champion Mfg. Co. 51
Bowen Products Corporation 144
Garrison Co., Inc. 48
Merchant & Evans Co. 248
Michigan Lubricator Co. 269
Monson, Charles S. 260
Tioga Mfg. Co. 50

Grinding Compounds
M. T. K. Sales Corporation 257

Heaters
Perfection Heater & Mfg. Co. 182

Hoists & Cranes
Archer Iron Works 273
Auglaize Motor Car Co. 278
Bay City Foundry & Machine Co. 240
Columbian Steel Tank Co. 228
Ford Chain Block Co. 256
Heil Co. 115
Horizontal Hydraulic Hoist Co. 272
Hydraulic Hoist Mfg. Co. 235
Mansfield Steel Corporation 276
National Steel Products Co. 281
Simplex Mfg. Co. 279
Standard Steel Works 262
Wood Hydraulic Hoist & Body Co. 271

Hoods
A. B. & B. Sheet Metal Works 271
Motors Metal Mfg. Co. 235

Horns
Klaxon Co. 191

Hose (Gasoline)
Metal Hose & Tubing Co., Incorporated..281

Hub Caps
Bossett Corporation, The 6

Hub Flanges
Bossett Corporation, The..... 6
Hydraulic Pressed Steel Co. 197

Hub Odometers
American Taximeter Co. 257
Johns-Manville, H. W., Co. 156, 157
Veeder Mfg. Co. 250

Humidifiers
M-R Co. 48
Whitney, R. S., Mfg. Co. 48

Ignition Specialties
American Bosch Magneto Corp. 188, 189
Apollo Magneto Corporation 283
Eisemann Magneto Corporation 172
Ericsson Mfg. Co. 259
Lauraine Magneto Co., Inc. 278
Packard Electric Co. 254
Splitdorf Electrical Co. 119
Teagle Co. 245
Westinghouse Elec. & Mfg. Co. 247

Jacks
Arrow Grip Mfg. Co., Inc. 264
Rowe Calk & Chain Co. 238
Walker Mfg. Co. 211

Lamps
Dietz, R. E., Co. 231

Lathes (Engine)
Cincinnati Lathe & Tool Co. 62
Davis Machine Tool Co., Inc. 61
Flather Mfg. Co., Inc. 63
Mueller Machine Tool Co. 61
Reed-Prentice Co. 62

Leather (Artificial)
O'Bannon Corporation 243

Links (Lock)
Rowe Calk & Chain Co. 238

Loading Equipment
Lee Loader & Body Co. 239

Locking Devices
Seymour, C. K., Corp. 252

Lubricants
Sinclair Refining Co. 265

Lubricators
Michigan Lubricator Co. 269

Machines
(See Tools, Machines, Etc.)

Magnetizers
Niehoff, Paul G. & Co., Inc. 278

Magnetos
American Bosch Magneto Corp. ..58, 188, 189
Apollo Magneto Corporation 283
Eisemann Magneto Corporation 172
Ericsson Mfg. Co. 259
Lauraine Magneto Co., Inc. 278
Splitdorf Electrical Co. 119
Teagle Co. 245

Malleable Castings
American Malleable Castings Association.155

Motors (Electric)
Dyneto Electric Corporation 269

Motors (Gasoline)
(See Engines, Gasoline)

Motor Generators
Acme Electric & Mfg. Co. 66

Mufflers & Cutouts
Geuder, Paeschke & Frey Co. 12
Powell Muffler Co. 280

Oils
(See Lubricants)

Oil Indicators
Michigan Lubricator Co. 269

Packings
General Asbestos & Rubber Co. 183
Johns-Manville, H. W., Co. 156, 157

Piston Inserters
Cloud Accessories Corp. 50

Piston Ring Extractors
Rush, W. S., Co. 51

Pistons, Rings & Pins
American Hammered Piston Ring Co. 9
Clark-Turner Piston Co. 233
Eco Manufacturing Co. 229
Gill Manufacturing Co. 178, 179
Modern Electric & Machine Co. 258
Piston Ring Co. 140
Pressure Proof Piston Ring Co. 255
Sinclair Mfg. Corp. 265
St. Louis Piston Ring Corp. 47

Pressed Steel Frames
Hydraulic Pressed Steel Co. 197
Parish & Bingham Corporation 143
Smith, A. O., Corporation 252

Pressed Steel Parts
Bossert Corporation, The 6
Geuder, Paeschke & Frey Co. 12
Parish & Bingham Corporation 143

Pressed Steel Tanks
Heil Co. 115
Janney, Steinmetz & Co. 267

Presses (Hand & Tire)
Excelsior Tool & Machine Co. 268

Primers
Jorgensen Mfg. Co. 146

Propeller Shafts
Snead & Co. 262
Spicer Manufacturing Corporation 158

Pumps (Circulation)
Felker Bros. Mfg. Co. 51

Pumps (Garage Tire)
(See Air Compressors & Pumps)

Pumps (Gasoline & Oil)
Bowser, S. F. & Co., Inc. 193
Tokheim Oil Tank & Pump Co. 45, 129

Pumps & Guns (Grease, Oil)
Bennett Injector Co. (Barrel Grease) 118

Pumps (Hand & Foot Tire)
Alert Sales Corp. 50

Pumps (Power Tire)
Kellogg Manufacturing Co. 11
Rex Machine Co. 275
Sunstrom Manufacturing Co. 275

Punches (Hand)
Smith & Hemenway Co., Inc. 47

Punch Presses
Excelsior Tool & Machine Co. 268

Radiators
G. & O. Manufacturing Co. 15
Long Manufacturing Co. 125
Modine Manufacturing Co. 237

Radiator Fans
Oakes Co. 153

Radiator Guards
Fundamental Corporation 274
Irving Iron Works Co. 243
Mansfield Steel Corporation 276
Stewart Iron Works, Inc. 270

BUYERS' INDEX—Continued

Rims
Firestone Steel Products Co. 87
Foley Traction Rim Co. 283
Goodyear Tire & Rubber Co. 114
Luverne Motor Truck Co. 268
Seymour, C. K. Corporation 252

Rim Tools
K. P. Products Co., Inc. 282

Rod & Yoke Ends
Cleveland Hardware Co. 280

Roller Bearings
Bower Rolling Bearing Co. 214
Gilliam Manufacturing Co. 120
Hyatt Roller Bearing Co. 138
Norma Co. of America 5
Timken Roller Bearing Co. 142

Roofing (Asbestos)
Johns-Manville, H. W., Co. 156, 157

Running-Boards & Shields
Hydraulic Pressed Steel Co. 197
Parish & Bingham Corporation 143

Running-In & Burning-In Stands
Service Station Equipment Corp. 64

Screw Machine Products
Barnes Wallace Co. 185

Sediment Traps
Jorgensen Mfg. Co. 146
Michigan Lubricator Co. 269

Service (Piston)
Modern Electric & Machine Co. 258

Sheet Metal Parts
A. B. & B. Sheet Metal Works 271
Motors Metal Mfg. Co. 235

Shims
Laminated Shim Co. 246

Sod Pans
Motors Metal Mfg. Co. 235

Soldering Irons
American Bureau of Engineering, Inc. .. 44

Spark Plugs
Hall Ignition Mfg. Co. 50
Lyons Ignition Co. 268
New York Mica & Mfg. Co. 51

Springs (Body)
Barnes Wallace Co. (Clutch) 185
Detroit Steel Products Co. 223
Harvey Spring & Forging Co. 148
Iron City Spring Co. 253
Jenkins Vulcan Spring Co. 255
Maremont Mfg. Co. 264
Mather Spring Co. 293
Perfection Spring Co. 164
Spring Perch Co. 7

Sprockets
Cullman Wheel Co. 277

Snow Plows
Baker Mfg. Co. 258

Stampings
Bossett Corporation, The 6
Brewer-Titchener Corporation 277
Geuder, Paeschke & Frey Co. 12
Hydraulic Pressed Steel Co. 197
Motor Wheel Corporation 257
Motors Metal Mfg. Co. 235

Starting & Lighting Outfits
American Bosch Magneto Corp. 188, 189
Dyneto Electric Corporation 269
Eclipse Machine Co. (Bendix Drive) 266
Splitdorf Electrical Co. 119
Westinghouse Electric & Mfg. Co. 247

Steel
Climax Molybdenum Co. 13
Hogan, John R. 244

Steel Castings
Ohio Steel Foundry Co. 237
Sivyer Steel Casting Co. 91

Steering Apparatus
Lavine Gear Co. 10
Ross Gear & Tool Co. 89

Step Hangers
Bossett Corporation, The 6
Brewer-Titchener Corporation 277
Hydraulic Pressed Steel Co. 197
Parish & Bingham Corporation 143

Tanks (Air, Gasoline & Oil)
A. B. & B. Sheet Metal Works 271
Bowser, S. F. & Co., Inc. 193
Clark, A. C. & Co. (Reserve) 48
Columbian Steel Tank Co. 228
Geuder, Paeschke & Frey Co. 12
Heil Co. 115
Janney, Steinmetz & Co. 267
Motors Metal Mfg. Co. 235
Tokheim Oil Tank & Pump Co. 129
Trageser, John, Steam Copper Works ..251

Tappets (Motor)
Jorgensen Mfg. Co. 146

Testing Apparatus (Electrical)
Service Station Equipment Corp. 64

Timers
Duplex Products Co. 51
Gladiator Co. 46
Schofield Mfg. Co. 49
Wayne Engineering Co. 49

Time Recorders
Calculagraph Co. 257

Tires
Fisk Rubber Co. 263
General Tire & Rubber Co. 276
Polack Tyre & Rubber Co. 111
Thermoid Rubber Co. 127, 145
United States Rubber Co. 109

Tire Inflators
(See Pumps, Power Tire)

Tire Reliners (Inner)
Ray Tire & Rubber Co. 46

Tire Repair Articles
American Shoe Machinery & Tool Co. .. 65

Tools, Machines, Etc.
Billings & Spencer Co. 205
Champion Mfg. Co. 65
Emco Mfg. Co. 65
Excelsior Tool & Machine Co. 268
K. P. Products Co., Inc. 282
Mossberg, Frank Co. 245
Service Station Equipment Corp. 64
Williams, J. H., & Co. 242

Tops
Detroit Weatherproof Body Co. 260

Top Materials
Du Pont Fabrikoid Co. 232
O'Bannon Corporation 243
Pantasote Co. 226

Torque Arms
Bossett Corporation, The 6
Hydraulic Pressed Steel Co. 197
Parish & Bingham Corporation 143

Tractors
Dart Truck & Tractor Corp. 269
Moline Plow Co. 134, 135
Traylor Engineering & Manufacturing Co. 174

Trailers
Arcadia Trailer Corporation 261
Automotive Trailer Corporation 126
Byron Engineering Works 254
Detroit Trailer Co. 264
Fruehauf Trailer Co. 271
Highway Trailer Co. 150
King Trailer Co. 269
Lapeer Trailer Corporation 236
Lee Loader & Body Co. 239
Ohio Motor Vehicle Co. 227
Nepessing Mfg. Corp. 43
Trailmobile Co. 210
Warner Mfg. Co. 250

Trailer Brake Equalizers
Raybestos Co. 45

Transmissions
Brown-Lipe Gear Co. 194
Cotta Transmission Co. 267
Covert Gear Co. 253
Detroit Gear & Machine Co. 199
Durston Gear Corporation 270
Fuller & Sons Mfg. Co. 201

Transmission Hangers
S K F Industries, Incorporated 103

Transmission Linings
General Asbestos & Rubber Co. 183
Staybestos Mfg. Co. 275

Truck Attachments & Converting Units
Carrier Motor Truck Co. 266
Swedish Crucible Steel Co. 265

Tubing (Steel)
Metal Hose & Tubing Co., Incorporated..281
Titeflex Metal Hose Corporation 255

Universal Joints
Arvac Manufacturing Co. 247
Baker Gun & Forging Co. 278
Blood-Bros. Machine Co. 255
Hartford Automotive Parts Co. 236
Merchant & Evans Co. 248
Pick, Carl Co. 240
R-S Manufacturing Co. 280
Snead & Co. 262
Spicer Manufacturing Corporation 158
Thermoid Rubber Co. 127, 145
Universal Machine Co. 266

Upholstery Material
DuPont Fabrikoid Co. 232
O'Bannon Corporation 243

Valve Lifters
K-D Mfg. Co. 65
Loomis-Beardsley Mfg. Co. 64

Warning Signals
Buell Manufacturing Co. 241

Welding Machines
General Asbestos & Rubber Co. 183

Wheels
Automotive Wood Wheel Manufacturers' Association 175
Clark Equipment Co. 95
Jaxon Steel Products Co. 137
Luverne Motor Truck Co. 268
Motor Wheel Corporation 257
Muncie Wheel Co. 273
Schwarz Wheel Co. 281
Sewell Cushion Wheel Co. 99
Sivyer Steel Casting Co. 46
West Steel Casting Co...Inside Front Cover

Whistles
Buell Manufacturing Co. 241
Duplex Machine Co. 49

Winches
Mead-Morrison Manufacturing Co. 208

Wire Wheel Hubs
Bossett Corporation, The 6

Wrenches
Mossberg, Frank, Co. 245
Williams, J. H., Co. 242

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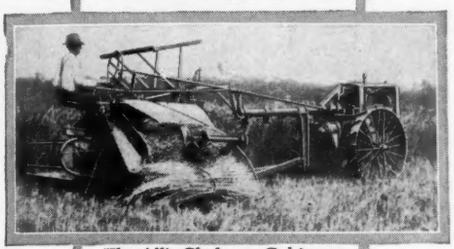

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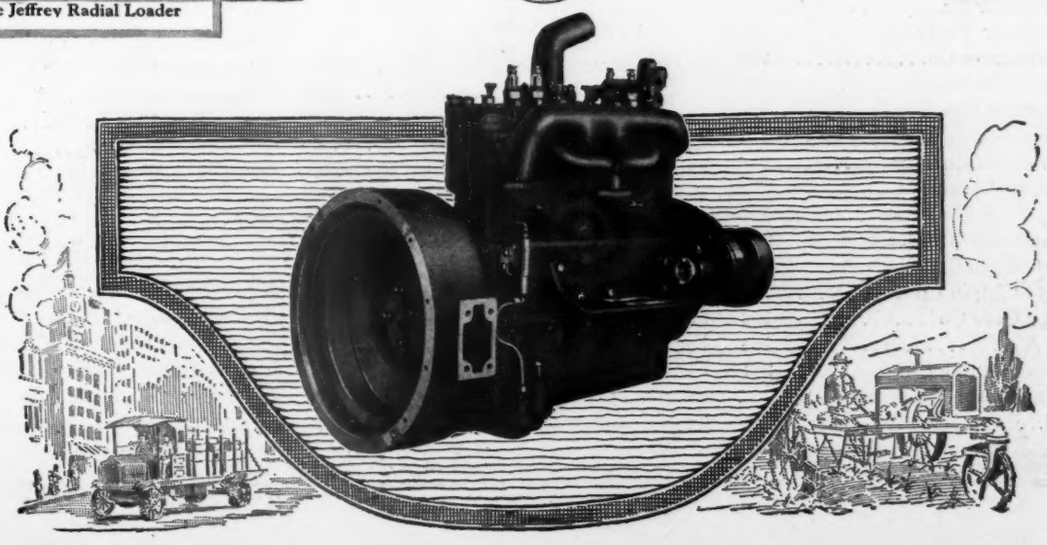


Advertisers' Index

A

A. B. & B. Sheet Metal Works..... 271
Acme Motor Truck Co..... 253
Adams Axle Co..... 262
Aetna Motor Corporation of New York..... 272
American Bosch Magneto Corporation.....188, 189
American Commercial Car Co..... 249
American Hammered Piston Ring Co. 9
American LaFrance Fire Engine Co., Inc..... 124
American Machine Co..... 288
American Malleable Castings Association 155
American Motor Truck Co 220
American Taximeter Co..... 257
Apollo Magneto Corporation..... 283
Arcadia Trailer Corporation..... 261
Archer Iron Works..... 273
Armleder, O., Co.....218, 219
Arrow Grip Mfg. Co., Inc..... 264
Arvac Manufacturing Co..... 247
Atlas Truck Corporation..... 168, 169
Atterbury Motor Car Co..... 93
Auglaize Motor Car Co..... 278
Autocar Co..... 16
Automatic Dump Car Co..... 256
Automotive Trailer Corporation.... 126
Automotive Wood Wheel Manufacturers' Association..... 175
Available Truck Co..... 187

B

Babcock, H. H., Co..... 123
Baker Gun & Forging Co..... 278
Baker Mfg. Co..... 258
Bantam Ball Bearing Co..... 256
Bargain..... 279
Barnes, Wallace, Co..... 185
Bay City Foundry & Machine Co.... 240
Bearings Co. of America..... 277
Bearings Service Co..... 282
Bennett Injector Co..... 118
Bessemer Motor Truck Co..... 198
Billings & Spencer Co..... 205
Blood-Bros. Machine Co..... 255
Bossert Corporation, The..... 6
Bound Brook Oil-less Bearing Co.... 133
Bowen Products Corporation..... 144
Bower Roller Bearing Co..... 214
Bowser, S. F., & Co., Inc..... 193
Brewer-Titchener Corporation..... 277
Bridgeport Motor Truck Co..... 261
Brown-Lipe-Chapin Co..... 194
Brown-Lipe Gear Co..... 194
Buda Co..... 101
Buell Manufacturing Co..... 241
Byron Engineering Works, Incorporated..... 254

C

Calculagraph Co..... 257
Carrier Motor Truck Co..... 266
Champion Machine & Forge Co..... 265
Childs, O. J., Co..... 180
Clark Equipment Co..... 95
Clark, J. L., Mfg. Co..... 267
Clark-Turner Piston Co..... 233
Cleveland Hardware Co..... 280
Cleveland Worm Gear Co..... 239
Climax Molybdenum Co..... 13
Clydesdale Motor Truck Co..... 141
Columbia Axle Co..... 192
Columbia Wagon Co..... 244
Columbian Steel Tank Co..... 228
Continental Motors Corporation.... 177
Cotta Transmission Co..... 267
Covert Gear Co., Inc..... 253
Cullman Wheel Co..... 277
Curtis Clutch Disc Co..... 259

D

Dart Truck & Tractor Corporation.. 269
Daubenspeck Chain Co..... 246
Day-Elder Motors Corporation..... 121
Defiance Motor Truck Co..... 4
Delaware Hard Fibre Co..... 259
Denby Motor Truck Co..... 275
Dependable Truck & Tractor Co.... 251
Detlaff, A. J., Co..... 249
Detroit Gear & Machine Co..... 199
Detroit Steel Products Co..... 223
Detroit Trailer Co..... 264
Detroit Weatherproof Body Co..... 260
Dietz, R. E., Co..... 231
Doehler Die-Casting Co..... 261
Drawer 47..... 276
Duplex Engine Governor Co. Inc. 274
Duplex Truck Co..... 206
Dupont Fabrikoid Co..... 232
Durston Gear Corporation..... 270
Duty Motor Co..... 282
Dyneto Electric Corporation..... 269

E

Eclipse Machine Co..... 266
Eco Manufacturing Co..... 229
Eisemann Magneto Corporation..... 172
Electric Storage Battery Co..... 151
Ericsson Mfg. Co..... 259
Excelsior Tool & Machine Co..... 268

F

Fafnir Bearing Co..... 270
Fageol Motors Co. [of Ohio] 173
Fahrig Metal Co..... 272
Federal Bearings Co., Inc..... 186
Federal Motor Truck Co..... 271
Firestone Steel Products Co..... 87
Fisk Rubber Co..... 263
Fitzgerald Mfg. Co..... 282
Foley Traction Rim Co..... 283
Ford Chain Block Co..... 256
Fruehauf Trailer Co..... 271
Fuller & Sons Mfg. Co..... 201
Fundamental Corporation..... 274

G

G. & O. Manufacturing Co..... 15
Garford..... 105
Gary Motor Truck Co..... 230
General Asbestos & Rubber Co..... 183
General Tire & Rubber Co..... 276
Geuder, Paeschke & Frey Co..... 12
Giant Grip Mfg. Co..... 196
Gilliam Manufacturing Co..... 120
Gill Manufacturing Co.....178, 179
Goodyear Tire & Rubber Co..... 114
Graham Brothers..... 267
Grant Motor Car Corporation..... 260
Gurney Ball Bearing Co..... 248

H

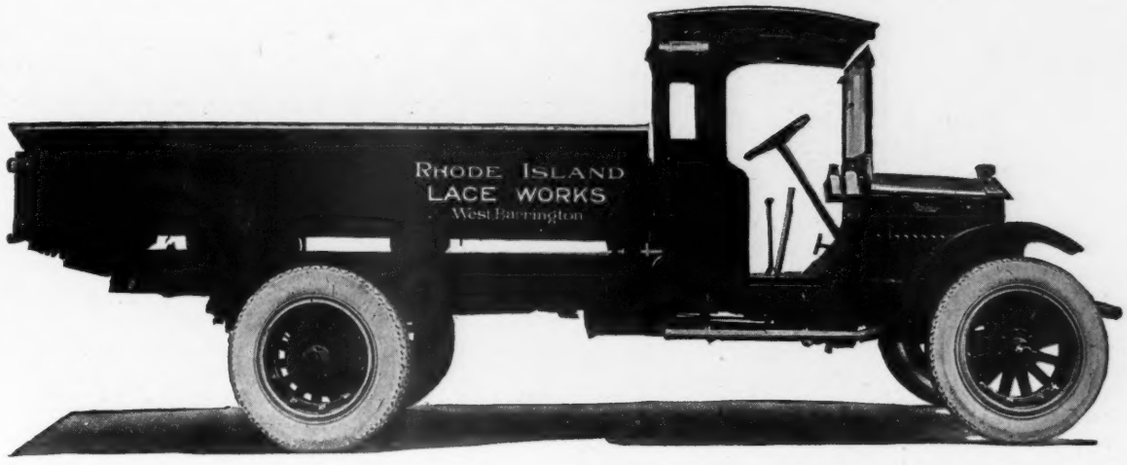
Harrisburg Manufacturing & Boiler Co..... 165, 166
Hartford Automotive Parts Co..... 236
Harvey Spring & Forging Co..... 148
Heil Co..... 115
Herschell-Spillman Motor Co..... 122
Hide, Leather & Belting Co..... 203
Highland Body Co..... 195
Highway Motors Co..... 280
Highway Trailer Co..... 150
Hogan, John R..... 244
Hoover Steel Ball Co..... 97
Horizontal Hydraulic Hoist Co..... 272
Hyatt Roller Bearing Co..... 138
Hydraulic Hoist Mfg. Co..... 235
Hydraulic Pressed Steel Co..... 197

I

Independent Motor Truck Co., Inc.. 234
International Harvester Co. of America, Incorporated..... 149
International Motor Co..... 159
Iron City Spring Co..... 253
Irving Iron Works Co..... 243

J

Jackson Motors Corporation..... 263
Janney, Steinmetz & Co..... 267
Jaxon Steel Products Co..... 137
Jenkins Vulcan Spring Co..... 255
Johns-Manville, H. W., Co..... 156, 157
Jorgensen Mfg. Co..... 146



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WORM DRIVE TRUCKS

Advertisers' Index—Continued

K

K. P. Products Co., Inc..... 282
Kalamazoo Motors Corporation..... 279
Kearns-Dughie Motors Corpor'n.... 276
Kellogg Manufacturing Co..... 11
Kentucky Wagon Mfg. Co., Inc..... 161
Keystone Motor Truck Corporation. 200
King Trailer Co..... 269
Kissel Motor Car Co..... 283
Klaxon Co..... 191

L

Laminated Shim Co..... 246
Lapeer Trailer Corporation..... 236
Larrabee-Deyo Motor Truck Co., Inc..... 238
Lauraine Magneto Co., Inc..... 278
Lavine Gear Co..... 10
Lee Loader & Body Co..... 239
Le Roi Co..... 289
Lewis-Hall Motors Corporation..... 204
Long Manufacturing Co..... 125
Luedinghaus-Espenschied Wagon Co. 242
Luverne Motor Truck Co..... 268
Lycoming Motors Corporation..... 167
Lyons Ignition Co..... 268

M

Maccar Truck Co..... 215
Mansfield Steel Corporation..... 276
Maremont Mfg. Co..... 264
Martin-Parry Corporation..... 222
Master Trucks, Inc..... 171
Mather Spring Co..... 293
Mead-Morrison Manufacturing Co.. 208
Merchant & Evans Co..... 248
Metal Hose & Tubing Co., Inc..... 281
Metropolitan Body Co..... 284
Michigan Lubricator Co..... 269
Midwest Engine Co..... 212
Minneapolis Steel & Machinery Co.. 184
Modern Electric & Machine Co..... 258
Modine Manufacturing Co..... 237
Moline Plow Co..... 134, 135
Monarch Governor Co..... 181
Monson, Charles S..... 260
Mossberg, Frank, Co..... 245
Motors Metal Mfg. Co..... 235
Motor Wheel Corporation..... 257
M. T. K. Sales Corporation..... 257
Multibestos Co..... 170
Muncie Wheel Co..... 273
Muskegon Motor Specialties Co..... 261

N

Napoleon Motors Co..... 270
Nash Motors Co..... 116
National Steel Products Co..... 281
Nelson Motor Truck Co..... 107
New Process Gear Corporation..... 154
Niehoff, Paul G., & Co., Inc..... 278
Noble Motor Truck Corporation..... 241
Norma Co. of America..... 5

O

Oakes Co..... 153
Oakley Chemical Co..... 284
O'Bannon Corporation..... 243
Obenberger, John, Forge Co..... 274
Ohio Motor Vehicle Co..... 227
Ohio Steel Foundry Co..... 237
Oneida Motor Truck Co..... 224
Oshkosh Motor Truck Mfg. Co..... 268

P

Packard Electric Co..... 254
Pantasote Co..... 226
Parish & Bingham Corporation..... 143
Park Drop Forge Co..... 272
Parker Motor Truck Co..... 209
Patriot Motors Co..... 262
Perfection Heater & Manufacturing Co..... 182
Perfection Spring Co..... 164
Pick, Carl, Co..... 240
Pierce-Arrow Motor Car Co..... 163
Pierce Governor Co..... 258
Piston Ring Co..... 140
Polack Tyre & Rubber Co..... 111
Powell Muffler Co..... 280
Pressure Proof Piston Ring Co..... 255

R

R. S. Manufacturing Co..... 280
Rainier Motor Corporation..... 291
Randall Steel Dumping Bodies Co... 277
Republic Motor Truck Co., Inc. Front Cover
Reynolds Motor Truck Co..... 136
Ross Gear & Tool Co..... 89
Rowe Calk & Chain Co..... 238
Rowe Motor Mfg. Co..... 14
Russel Motor Axle Co. Inside Back Cover

S

S K F Industries, Incorporated..... 103
Sanford Motor Truck Co..... 113
Schacht, G. A., Motor Truck Co.... 147
Schwarz Wheel Co..... 281
Selden Truck Corporation..... 8
Service Motor Truck Co..... 213
Sewell Cushion Wheel Co..... 99
Seymour, C. K., Corporation..... 252
Sharon Pressed Steel Co..... 112
Sheet Steel Products Co..... 263
Sheldon Axle & Spring Co..... 285
Signal Motor Truck Co..... 110
Simplex Manufacturing Co..... 279
Sinclair Refining Co..... 265
Sivyer Steel Casting Co..... 91
Smith, A. O., Corporation..... 252
Snead & Co..... 262
Spicer Manufacturing Corporation.. 158
Splitdorf Electrical Co..... 119
Spring Perch Co..... 7
Standard Motor Truck Co..... 202
Standard Steel Works..... 262
Staybestos Mfg. Co..... 275
Stewart Iron Works, Inc..... 270
Stewart Motor Corporation..Back Cover
Stromberg Motor Devices Co..... 221
Sullivan Motor Truck Corporation.. 265
Sundstrom Manufacturing Co..... 275
Swedish Crucible Steel Co..... 265

T

Teagle Co..... 245
Thermoid Rubber Co..... 127, 145
Thomart Motor Co..... 139
Tiffin Wagon Co..... 152
Timken-Detroit Axle Co..... 117
Timken Roller Bearing Co..... 142
Titan Truck Co..... 259
Titeflex Metal Hose Corporation... 255
Tokheim Oil Tank & Pump Co..... 129
Torbensen Axle Co..... 162
Tower Motor Truck Co..... 256
Traffic Motor Truck Corporation 131, 132
Trageser, John, Steam Copper Works 251
Trailmobile Co..... 210
Transportation Equipment Co., Inc.. 275
Transportation Finance Co., Inc..... 284
Transport Truck Co..... 176
Traylor Engineering & Mfg. Co..... 174
Turner & Moore Mfg. Co..... 266

U

U. S. Ball Bearing Mfg. Co..... 207
Union Motor Truck Co..... 274
Union Switch & Signal Co..... 234
United States Motor Truck Co., Inc. 264
United States Rubber Co..... 109
Universal Machine Co..... 266

V

Veeder Mfg. Co..... 250
Vulcan Motor Axle Co..... 225

W

Walker Axle Co..... 260
Walker Mfg. Co..... 211
Walter Sales Co..... 216
Ward LaFrance Truck Corp..... 281
Ward Motor Vehicle Co..... 190
Warner Gear Co..... 160
Warner Mfg. Co..... 250
Waukesha Motor Co..... 273
Weeks-Hoffman Co..... 258
Weidely Motors Co..... 294
Western Drop Forge Co..... 130
Westinghouse Electric & Manufacturing Co..... 247
West Steel Casting Co. Inside Front Cover
Williams, J. H., & Co..... 242
Wilson, J. C., Co..... 273
Winther Motor Truck Co..... 128
Wisconsin Motor Mfg. Co..... 263
Wisconsin Parts Co..... 283
Wood Hydraulic Hoist & Body Co.. 271
Wyman-Gordon Co..... 279

Z

Zenith Carburetor Co..... 217

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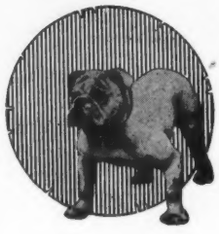

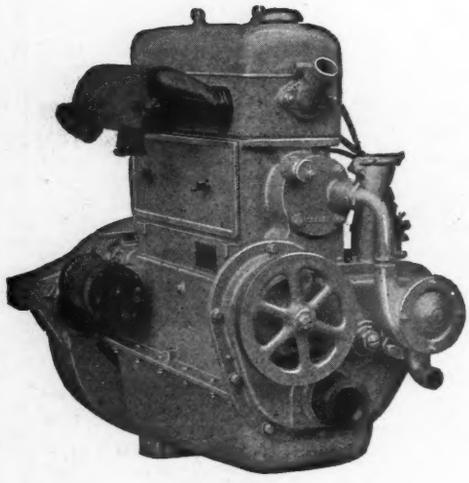

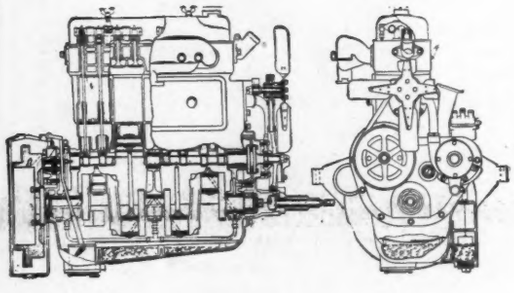

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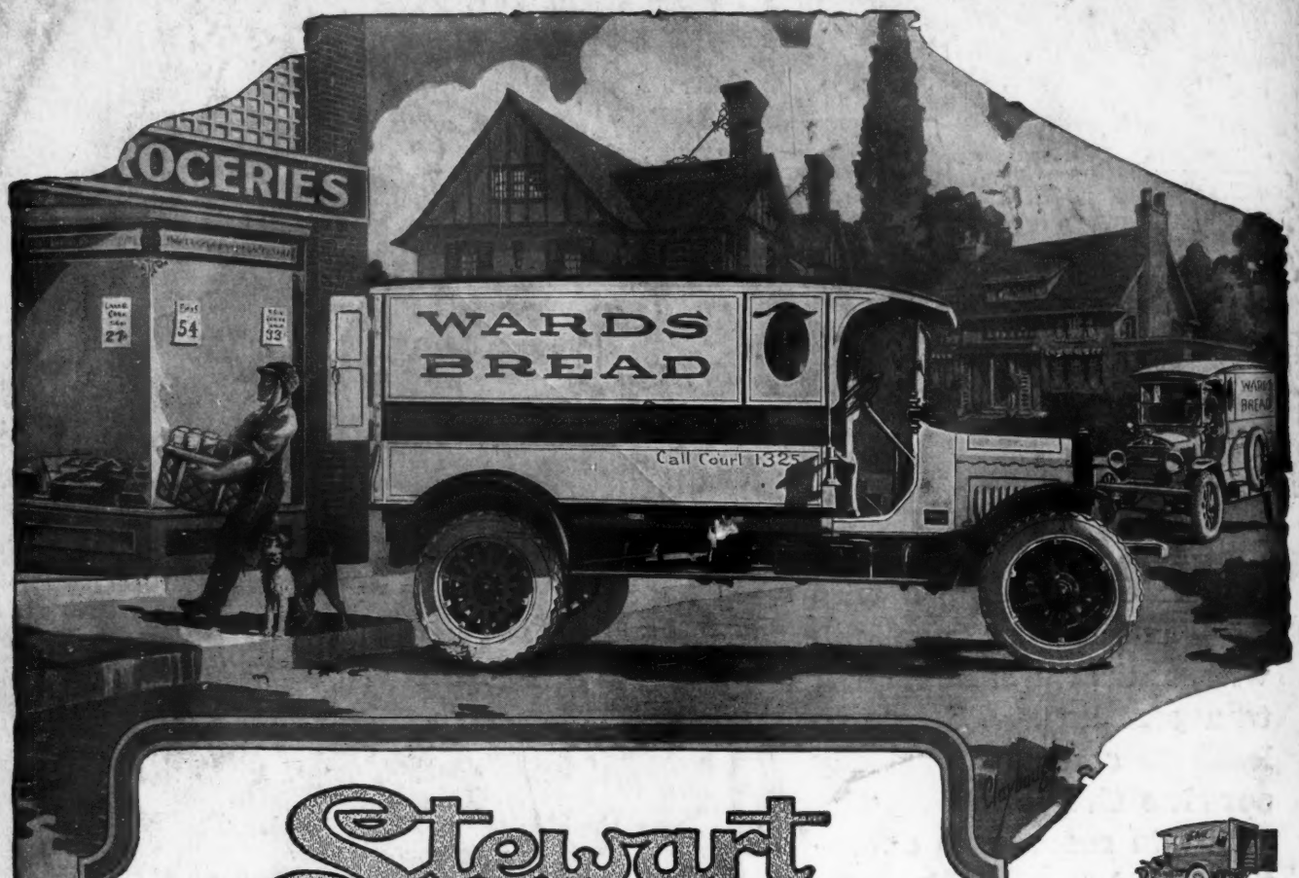

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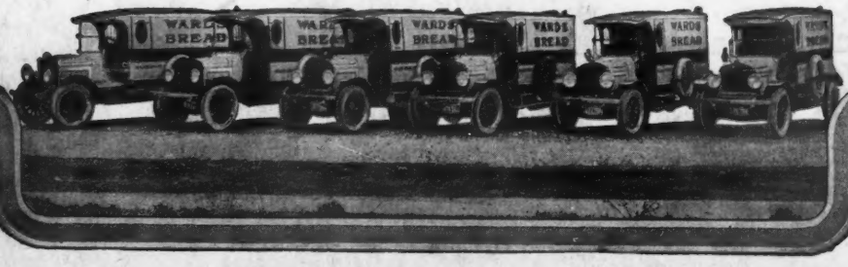

¾ Ton

1 Ton

1½ Ton

2 Ton

2½ Ton

3½ Ton